

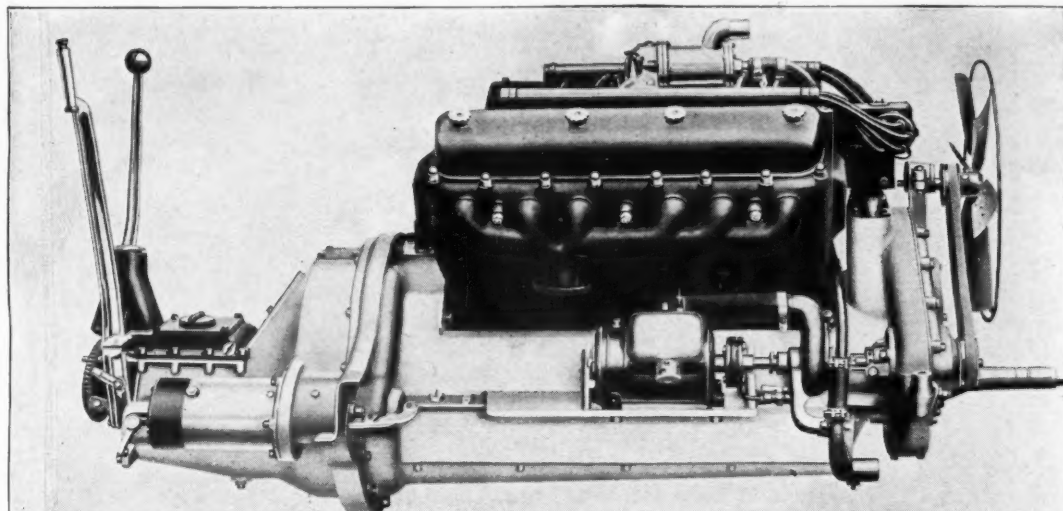
In This Issue—Public Demands Better Service

MOTOR AGE

Vol. XLIV
Number 10

PUBLISHED WEEKLY AT THE MALLERS BUILDING
CHICAGO, SEPTEMBER 6, 1923

Thirty-five Cents a Copy
Three Dollars a Year



THE FAMOUS HAYNES TWELVE-CYLINDER MOTOR (Complete as illustrated)

Sacrifice Sale of all Remaining

HAYNES 12-Cylinder Motors

Formerly \$600, Now \$175 Plus tax at factory

These motors were manufactured for Haynes automobiles selling for \$4,950. The mechanical perfection of this type of motor has been tested in the hands of Haynes owners, and the accuracy of design and engineering excellence are assured by over 30 years' experience in building Haynes cars.

If Haynes automobiles were still built with 12-cylinder motors, we would value these motors at many times their present price. But under present conditions the Haynes factories are concentrating on the production of the Haynes 60 six cylinder motor, and these 12-cylinder motors are, therefore offered at a price which makes them a tre-

mendous value. This is your opportunity. Buy one of these motors and install it in a service car. Install these motors in used cars and sell the whole job at a profit.

The performance of these motors at sustained high speed has been demonstrated, in the Chicago automobile dealers race at the Chicago Speedway, won by the Haynes equipped with this motor, in 1918.

Can you use one or more of these motors? At this price they will sell rapidly. Write or wire the factory immediately, or call long distance telephone Kokomo 2900.

All orders subject to prior sale.

Specifications Haynes Light Twelve Motors

TYPE—Special Haynes design and manufacture; unit power plant, three-point suspension.

HORSE POWER—36.3 horsepower, S. A. E. rating.

CYLINDERS—Valve-in-head type, 2 3-4 inch bore, 5-inch stroke.

PISTONS—Lynite, equipped with two rings above wrist pin and one below.

CRANK SHAFT—Balanced dynamically and statically. Three main bearings.

VALVES—Located in head, easily accessible, inclosed in dustproof housing.

CRANK CASE—Aluminum.

CAM SHAFT DRIVE—Chain drive.

BEARINGS—Die cast with bronze backs.

GASOLINE SYSTEM—Vacuum system.

CARBURETOR—Mounted between cylinder blocks.

LUBRICATION—Pressure feed to all bearings. Oil level gauge on crank case.

STARTER—Bendix drive on flywheel.

IGNITION—[Delco] 120 A. H. capacity, storage battery charged by a generator coupled with timing chains.

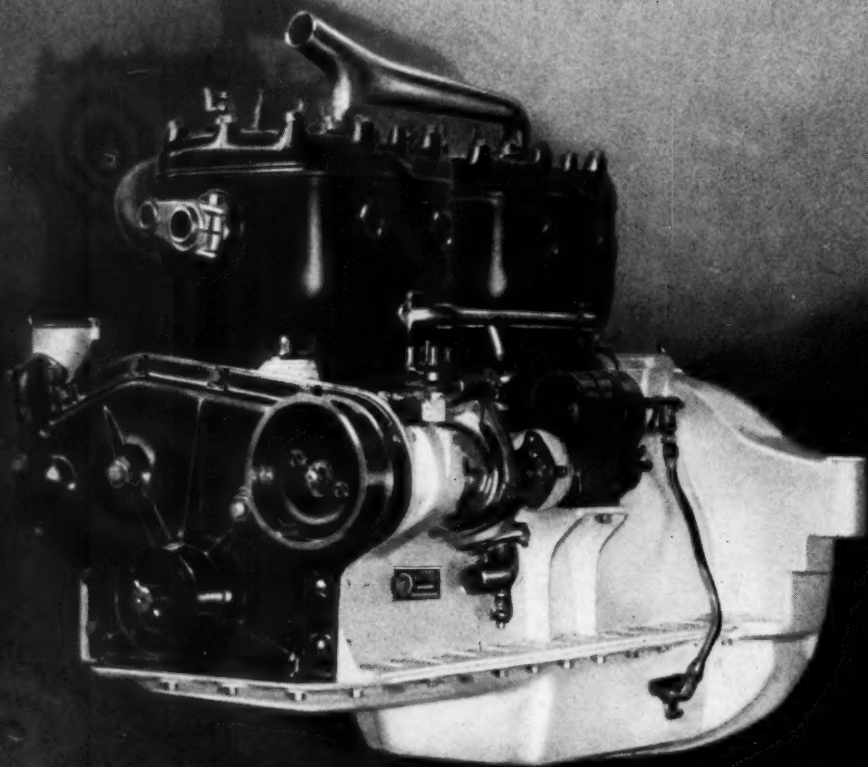
COOLING—A large centrifugal pump forces water around cylinders and valve seats. The fan is 16 inches in diameter and has 6 blades.

CLUTCH—Single driven dry plate with floating asbestos friction rings.

TRANSMISSION—Selective type, sliding gear, three speeds forward and one reverse. Heat treated chrome vanadium gears.

Special Notice. The Haynes Automobile Company is not obligated to fill orders received after its stock of twelve-cylinder motors is exhausted. Prices and specifications subject to change without notice.

THE HAYNES AUTOMOBILE COMPANY, Kokomo, Indiana. Export Office: 342 Madison Ave., New York City, U. S. A.



*The New Series, Model B5—
a truck motor. Just one
of the many Continentals
built to fill every truck
requirement.*

TWENTY-TWO years devoted by the largest organization of motor specialists in the world to the building of motors have placed the Red Seal Continental Motor above comparison and beyond competition. The established mark of this motor specialization is and always will be—the Continental Red Seal.

Built by the largest motor Specialists in the world

CONTINENTAL MOTORS CORPORATION

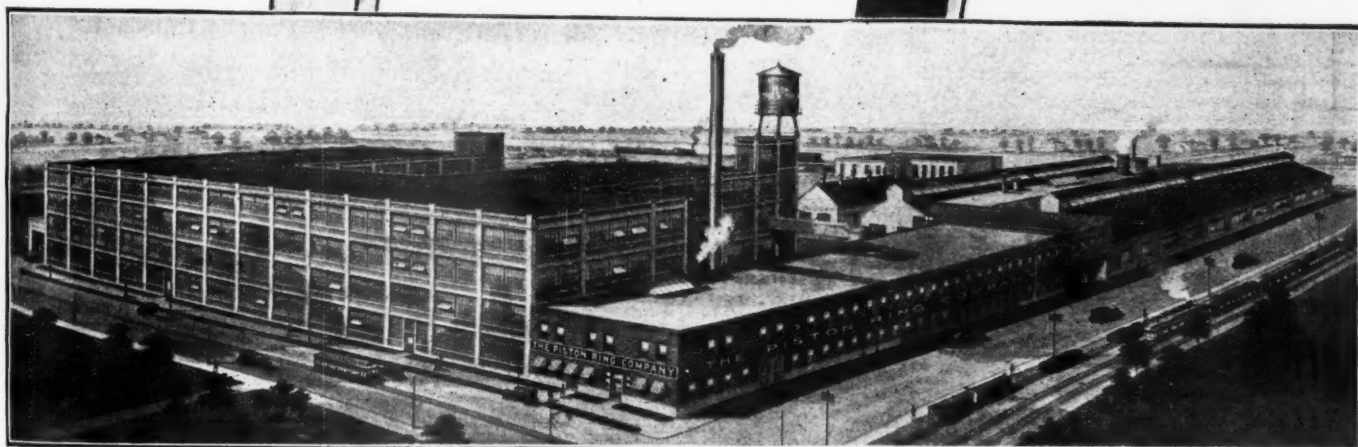
Detroit and Muskegon, Michigan



3,000,264

rings in one month

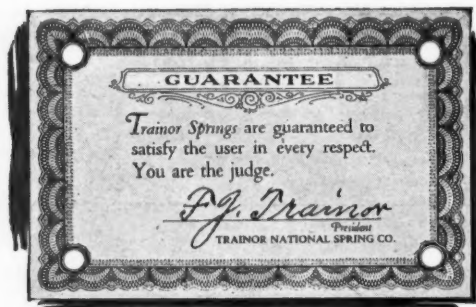
QUALITY Piston Rings
are stocked in 4,557
standard sizes and over-
sizes and list as low as
25c.



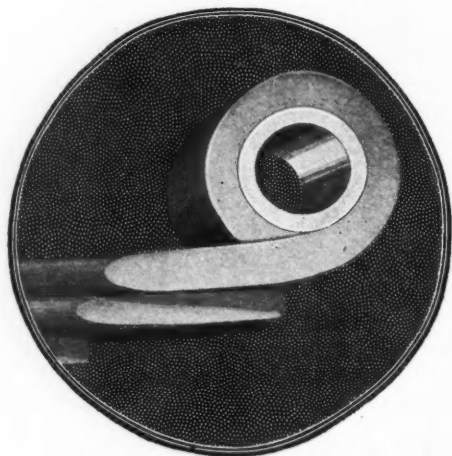
The Piston
RING COMPANY
Muskegon, Michigan

QUALITY

Piston Rings

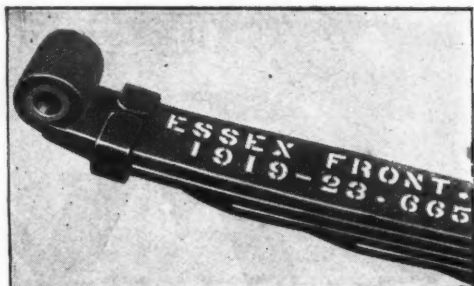


Another Reason Why The Trainor Guarantee is Possible



BRONZE BUSHINGS

For longer wear, Trainor uses bronze bushings in all passenger car springs except those for Fords—even though the original equipment is steel bushed.



EASIER TO KEEP STOCK

To simplify your stock-keeping, the make and model of the car, the position (front or rear) and the catalog number are all plainly marked on every Trainor Spring as shown above.

WHEN the replacement demand and our experience proves that the "original equipment" spring is improperly designed to carry the load, we improve that spring—make it *better* than the original.

If it were not for the unqualified Trainor Guarantee we could be content to exactly duplicate the "original equipment" spring in every case—but such a guarantee obligates us to improve those springs that are obviously weak.

A Trainor Spring has the same dimensions as the "original equipment" spring, of course, and it fits perfectly the car for which it is intended. But it is designed to carry the load and give the satisfaction assured by the Trainor Guarantee.

Trainor Improved Springs will build a permanent and profitable business for you. We invite correspondence with recognized automotive jobbers. Dealers should write for the name of the nearest Trainor jobber.

TRAINOR NATIONAL SPRING CO., NEW CASTLE, IND.



MOTOR AGE

Reg. U. S. Pat. Off.

Published Every Thursday by

THE CLASS JOURNAL COMPANY

MALLERS BUILDING
59 East Madison Street, CHICAGO

Vol. XLIV

Chicago, Sept. 6, 1923

No. 10

CONTENTS

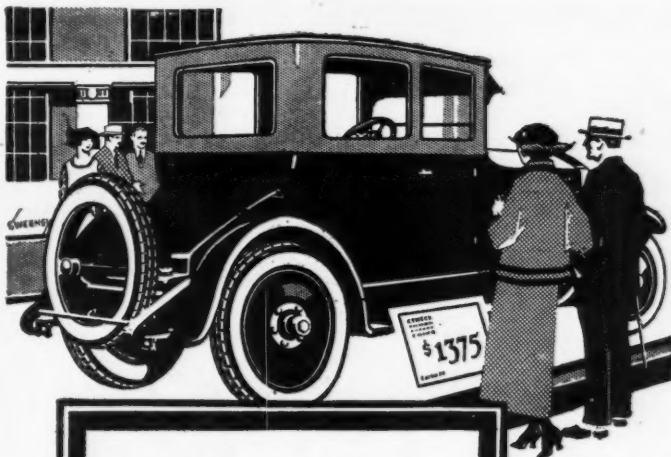
To Deliver Service, It First Must Be Sold.....	9
By B. M. Ikert	
New Series of Moon Six Cylinder Cars.....	12
1924 Oakland Six Completely Redesigned.....	13
Improved Mechanical Units Feature New 1924 Cleveland Six Models.....	18
Bill Fixit's Return.....	19
By A. H. Packer	
Community Service Stations.....	23
By A. H. Packer	
Sparkville Greasehounds Association Annual Labor Day Picnic.....	25
By Carl A. Most	
MOTOR AGE'S Picture Pages of Automotive Interest	26
Editorials—	
The Pedestrian	28
Statistics and Facts.....	28
The Air Mail	28
Encouraging Service	29
Wonder What a Clearing House Editor Thinks About.....	29
New Models	29
News of the Industry—	
New Models Hold Interest of Everyone.....	30
Factories Look for Better Conditions in September.....	31
Mount Says Condition of Farmers Is Much Improved.....	32
International Transport Congress to Be Held in May.....	33
Accessory and Parts Sales Show Only Slight Decline.....	34
Investigations Now in Order for Gasoline Business.....	35
Expansion and Changes Mark Progress in Boston.....	36
Collins Proceeds with Plan for 6-Cylinder Car.....	37
Mohawk and Star Rubber Companies Agree on Merger	38
Business Notes	39
Concerning Men You Know.....	40
In the Retail Field.....	41
The Readers' Clearing House—	
The Rewinding Boss Was a Little Too Sure.....	42
Operation of Carburetor on Hudson.....	47
Replacing Gears in 1912 Hudson Transmission.....	44
Wiring on Model 16 Chandler.....	45
Marvel Carburetor on Buick.....	46
Shop Activity Seen Through Windows in This Service Station	43
Getting More Out of the Shop.....	48
Boosting Accessory Sales.....	49
Coming Motor Events.....	50
Squeeks & Rattles.....	50
Specifications of Trucks, Tractors and Passenger Cars	51-56

Index to Advertisers Next to Last Page

SUBSCRIPTION RATES

United States, Mexico and U. S. Possessions.....	\$ 3.00 per year
Canada	5.00 per year
All Other Countries in Postal Union.....	6.00 per year
Single Copies	35 cents

Subscriptions accepted only from the Automotive Trade

Entered as Second Class Matter Sept. 19, 1899, at the Post Office
at Chicago, Ill., under Act of March 6, 1879.

Building on Known Quality

From Michigan we get
this dealer's comment:

"The fact that nearly all car
manufacturers are using
Goodrich on a good share
of their production is an-
other big sales stimulus.
This makes replacement
business later on, but the big
thing is that the general
public accept it as an un-
qualified endorsement of
Goodrich Tires."

Cobb Auto Supply
Lakewood, Michigan

True, Goodrich Tires
have such standing, also
true, that once a motor-
ist starts using Goodrich
it is a comparatively
easy matter to get his
order for replacements
and spares.

But what is back of all
this? National advertis-
ing, yes; a close dealer
cooperative-sales policy,
yes; but first and last,
the Tire itself. That
alone holds business for
the dealer.

THE B. F. GOODRICH RUBBER CO.
Akron, Ohio

Goodrich TIRES

"Best in the Long Run"



That's the Right Way.

There's only one quick, easy and accurate way to make bearing adjustments—Laminated shims! Just peel 'em down to fit and the job is done. 90% of car and engine builders and the majority of servicemen throughout the country use Laminum because no other method is so efficient and so accurate.

THE SERVICE KIT

An all-steel box containing a complete assortment of 250 shims for all makes of cars. Just take 'em from the kit and peel 'em down to fit.



THE CAR DEALERS' KIT

An all-steel box containing 250 shims for all models of popular makes of cars. Just what is needed in the Service Department. Each shim in its place ready for instant use.



Send for Sample Shim
Address "Sales Dept."

LAMINATED SHIM COMPANY, Inc.
14th St. and Governor Pl., Long Island City, N. Y.
St. Louis: Mazura Mfg. Co. Detroit: Dime Bank Building

LAMINUM

INTEGRITY



SERVICE

It is hard to make comparison selling the Studebaker line of sizes, with any other make of car. For the past seven and one-half years I have sold a one chassis, four-cylinder automobile - never again, as salesman - sales manager, or dealer! Covering the retail field with a \$1,000 car - a \$1,500 car - a \$3,000 car, as compared to a line that embraces all models, all prices, is like shooting ducks with a 22 rifle.

A Studebaker salesman walks into a prospect's office - ready to do business. Ready with price - size - style - model - nothing lacking, a full sales kit bag. There can be but one result - trebled earning power.

It is not the exception, but the rule, to find \$10,000 per year salesmen in many Studebaker organizations. I know of two that have made better than \$8,000 in the first six months of 1923.

Give me a complete line - There is only one - Studebaker Sizes, 1924.

*

*Name upon request

Are You "After Ducks with a 22 Rifle"?

This letter is typical of many received from retail men who have found their big opportunity—with Studebaker.

Are you paying the penalty in lost orders because your line does not include cars of the right style, size and price to suit *all* your prospects? How many sales have you lost trying to fit your prospect to the car instead of the car to the prospect?

There are as many dollars in the sales you *lose* as those you make.

Compare your situation with that of the Studebaker salesman. He has three distinct models in twelve body styles (1924 series) ranging, in size, from two to seven passengers; and in price, from \$975 to \$2750. He covers the whole quality market.

The Studebaker dealer can often use another good retail salesman. Have a talk with him. You know the old story about opportunity.

1924 MODELS AND PRICES—f. o. b. factory

LIGHT-SIX 5-Pass., 112" W. B., 40 H. P.	SPECIAL-SIX 5-Pass., 119" W. B., 50 H. P.	BIG-SIX 7-Pass., 126" W. B., 60 H. P.
Touring.....\$995	Touring.....\$1350	Touring.....\$1750
Roadster (3-Pass.)..... 975	Roadster (2-Pass.).....1325	Speedster (5-Pass.).....1835
Coupe-Roadster (2-Pass.)1225	Coupe (5-Pass.).....1975	Coupe (5-Pass.).....2550
Sedan.....1550	Sedan.....2050	Sedan.....2750

THE STUDEBAKER CORPORATION OF AMERICA
South Bend, Indiana

T H I S I S A S T U D E B A K E R Y E A R

POWER

COMFORT

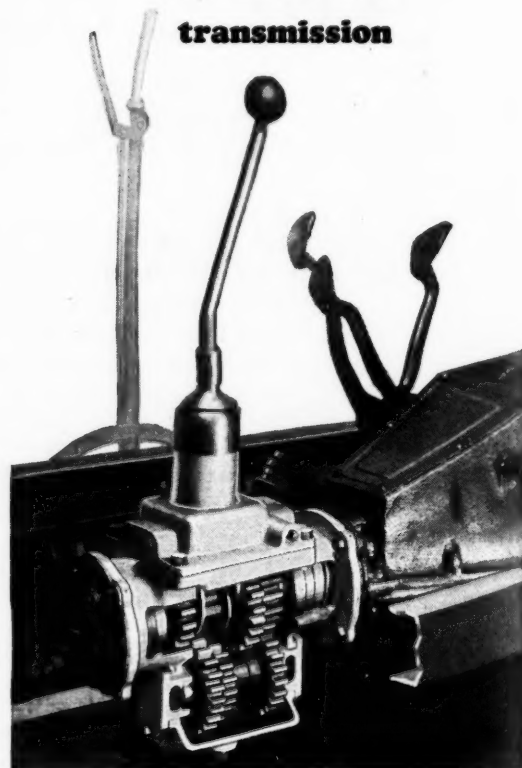
Warford

AUXILIARY TRANSMISSION

A Ford truck plus a Warford transmission provides the carrying capacity of TWO Ford trucks, with the bed-rock economy of ONE Ford truck. The costliest 2-ton trucks haul full two tons no more easily than the Ford with six speeds forward supplied by Warford—an UNDERDRIVE for brute pulling power—an OVERDRIVE for fast road speed at easy engine speed. Warford has Timken bearings, vanadium shafts, 3½% nickel gears and aluminum case, because only a transmission as good as the whole Ford truck can win you the profits of the 2-ton market. Write.

**The Warford Corporation
44 Whitehall Street, New York**

**No change
in the Ford
transmission**



AUBURN, N. Y.
Foster-Warford Co.
BALTIMORE, Auto
Accessory Association
26 S. Greene St.

CANTON, Ohio
Dine-De Wees Company
400 Walnut Ave., S. E.
DALLAS
Houdaille-Polk Co.
2218 Commerce St.

DAVENPORT, Iowa
Sieg Company
DENVER, Motor
Specialties Company
17 W. 13th Avenue

MEMPHIS
Continental Body Co.
476 Union Ave.
MINNEAPOLIS
McGee White Corporation
1311 Hennepin Ave.

NEW YORK
Motive Parts Corporation
796 10th Ave.
SAN FRANCISCO
Warford-Pacific Co.
1111 Post Street

STOCKBRIDGE, Mich.
Transmission Sales Co.
VANCOUVER, B. C.
E. W. Jay
WICHITA, Kans.
Price Auto Service Co.
301 S. Topeka Ave.



Famous "Alameda" is Now Marmon Row San Jose Dealer Has Big Success

In less than one and a half years C. D. Singleton, Marmon dealer of San Jose, California, has placed twelve Marmons in five adjoining blocks of "The Alameda."

San Jose is a city of 45,000 population, 50 miles from San Francisco.

"The Alameda" is the famous road joining the two cities. In California's early days the Franciscan Fathers trod this noted way. To-day it is bordered by the dwellings of San Jose's exclusive set.

The fact that it took less than eighteen months of selling effort to place twelve Marmons in five blocks

on this exclusive thoroughfare is but another example of the concentration of Marmon acceptance.

It signalizes the manner in which any alert dealer in a city of moderate size can make use of the Marmon franchise to build up substantial profits.

There is an opportunity to duplicate San Jose's Marmon success in every moderate and small-sized city in the country.

If you will get in touch with us we shall be glad to outline the profit possibilities of the Marmon franchise as it applies to your own territory.

NORDYKE & MARMON COMPANY

Established 1851

INDIANAPOLIS, INDIANA

MARMON

"X" LIQUID

REPAIRS LEAKS IN AUTO RADIATORS, CRACKED CYLINDERS
WATER JACKETS AND STEAM AND HOT WATER HEATING SYSTEMS



"Just Pour It In"

FOR YEARS

"X" LIQUID

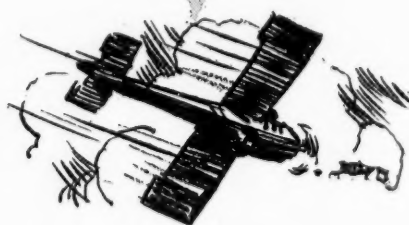
has been used in the Automobiles and Trucks of the United States Government, Standard Oil, General Electric, American Telephone and Telegraph, etc., and by 30,000 Steamfitters for repairing Leaks in Hundreds of Thousands of jobs every year without shutting down.

USED BY

U. S. GOVERNMENT
to Repair Cracked Steel Water Jacket of U. S. Navy Seaplane N. C. 4 when forced down in Portugal on its trans-Atlantic flight May 16-27, 1919, and carried ready for emergency by the U. S. Army Aeroplane T. 2 on its Ocean-to-Ocean Non Stop flight, May 3, 1923.

**Over 3,000,000 Cans
SOLD YEARLY**

On Sale at Every Auto Accessory Dealer, Garage, Hardware, Mill, Mine, Oil Well, Ship Chandler and Plumbing Supply House in United States and Canada.



MOTOR AGE



Oh see the pret-ty la-dy.
What does the la-dy want in the dir-ty ga-rage?
She is look-ing for the ser-vice man-a-ger.
Why is he not in his of-fice man-ag-ing?
We do not know. Do you?

To Deliver Service It First Must Be Sold

Trouble in the Past Has Been That We Have Too Often Reversed This Simple Business Axiom. We Have Men, Machinery and Tools for Delivering the Work, but Are Lacking in Our Service Salesmanship. Public Is Motorwise and More Exacting in Its Demands for a Higher Standard of Automotive Maintenance

By B. M. IKERT

AS time goes on service and maintenance will have to be sold more intelligently and efficiently.

This is true because the motoring public will demand it. It is true because at the present time the public is motorwise and daily becomes more so. More and more owners now are driving their second and third car.

A man when he buys his first car usually looks upon the service man as a guardian angel and has implicit faith in all the latter does. The new owner does not know any better. To him the service man is a motor

wizard; can fix anything, and he accepts things as they are handed to him.

But after the zest of driving the first car begins to wear away and the vehicle appeals to him more from a utility standpoint, the man becomes more interested in the economical side of transportation. And when he gets to this point he is directly at the threshold of the service and maintenance question.

Those who own their second, third or fourth car, as the case may be, seek the establishment that will give them the best service for their money.

We say, "Don't take your car to the alley repairman." But we often overlook the fact that the alley repairman in his humble shop often renders far more intelligent service than the authorized service station of the car in question.

Recently we asked a man if he was satisfied with the service department of a large distributor. He said "I never take my car there. They have a large institution, but they have a rotten service department."

Upon closer questioning we found that this man was taking his car to a so-called "alley shop," which was operated by two young fellows who made a specialty of maintenance work on the make of car this man was driving. These men had established a good reputation and knew how to fix a job right the first time.

Is it any wonder then that these owners, who have become motorwise and who demand first class work, seek this shop? Check up on the cars you have sold in your community and see if you have every one of them listed on your service records. If you have not, where are the missing ones buying their service? And, why do they steer clear of your place?

If you are an analyst, the chances are ten to one you will find that you are not selling your service and maintenance as it should be sold. Too many in this business overlook that common business axiom that you must first sell a thing and then deliver it. In the past we have tried to sell the job after delivering it. And it has been the reversal of this common business axiom that makes it so hard to collect many a repair bill.

Wonderful strides have been made in the maintenance end of the industry in various ways. We have excellent facilities for turning out good work and there is no excuse for falling down on the job in this respect. We have excellent buildings, and for the most part the better class shops are well laid out. Everything has been done to speed up a job and do it well. There are lathes, drill presses, electric drills, grinders, chain falls, speed wrenches and a thousand and one smaller hand tools that help to do a job right, mechanically speaking.

But in spite of all this, why is it that we must so often wrangle with the customer over the price of the repair job? It is because we have arranged only for the delivery of the goods and have fallen down on the selling end. There are too many technical men in the maintenance end of the business and not enough salesmen—service salesmen.

Service Salesmanager of the Future

As time goes on it is very likely that the service manager, so-called, will be a thing of the past. As it is now he is everything from the foreman of the shop to the mechanic under a car, who crawls out dirty and greasy to meet the customer. We are going to change the title of service manager to that of service sales manager in the future. And he will be a salesman. One who knows the psychology of selling. All he says and does will be and must be said and done from a sales standpoint.

Sometimes because a man is a crackerjack mechanic we make him "service manager." We do it because we think this man will know how to handle every job; he is a technical man, trained in mechanics and shop methods. But, because he is merely a good mechanic he falls down as a "service manager." He knows how to deliver the job, but not how to sell it. The latter is distinctly the salesman's job.

The general public is our customer, and to that end we must do the things which he is used to in other lines. No one would expect to go into a high class restaurant and find the manager out in the kitchen with a dirty apron on dishing out soup. But we do that very thing, literally speaking, in our service establishments.

Here is an incident that occurred the other day, and it happens every day, many times over, in service stations all over the country.

The writer was talking to the owner of quite a large automobile establishment, and in due time was conducted on the "service manager." The trail lead through a lot of cars, considerable dirt and grease to the "manager's" office. He was not there, but presently appeared from under a car that was raised at the front end by a chain falls. The owner of the place introduced the writer to the "service manager," and the latter seemed quite chagrined that he could not shake hands,

because they were greasy, due to the fact that he had been struggling with some messy job that should have been turned over to someone else.

Perhaps it was a tough problem with which he had been struggling, but his job was to sell the service and not actually work on a job. Had the writer been a customer seeking the service manager the situation would have been no different. The stage was in no way set and what the writer experienced is exactly what a customer would have experienced.

What clothing store, even in a small town, can you recall where the man who sells you the suit of clothes also makes the alterations on it? If he did that, then other customers as they came in would simply have to wait.

Why are you so particular to have your salesroom neat and clean? Why do you insist that salesmen have the proper approach when greeting a customer? Why don't you require your new car salesmen to be technical men and capable of going out on the road with customers shooting trouble? And, why do you insist that the new car salesmen come forward with a smile every time a customer comes in?

The Line Between Selling and Shop Work

Does the salesman who sells a man a car also install the bumper which he sells the customer? No. Certainly not. That is left for the technical man, the mechanic. The accessories are installed in another department and entirely apart from the sales department.

That is exactly what must take place in the proper selling of service and maintenance. There must be a sharp line of demarcation between the selling of maintenance and the actual carrying out of the work. The one must come under the direction of a service sales manager and the other the service superintendent. In the small shop the latter job probably will fall to the shop foreman.

But just as long as a mechanic or shop foreman is allowed to meet the buying public, just so long will the public kick on service.

How long a man or woman remains your customer does not lie in your hands or in the hands of your sales department. It does lie in the hands of your service and maintenance department. That department alone says whether or not you get a repeat order from the customer. And we know that the repeat order is the life of your business.

The flat rate system or piece work plan of selling service and maintenance is contributing probably as much as any other single factor to the intelligent selling and delivering of the product. This is true because with both systems you sell the job first. It requires a service sales department.

One of the salient features that soon was in evidence with the advent of the flat rate system was the fact that system played a major part. Without system you cannot have a flat rate, and it has been the lack of system, lack of a selling system, that has caused so many shops to fall down in the past on their service.

Even in this day and age when service and maintenance have forged to the front as the most important part of the dealer's business, it is surprising how many concerns there are who do not as yet look upon service and maintenance in the right light.

Recently a man called on us who was trying to get some system into the service department of the concern with which he was established. This man was connected with an organization that had at its head some pretty good business men, who had been in the automotive business for some years. But unfortunately they had the old idea that the sale of new cars was the big end of their business.

The Right View of Service and Maintenance

We grant that primarily everyone in this business is in it to sell automotive vehicles. But we also maintain that the surest way to sell automotive vehicles is to sell service and maintenance as they should be sold.

The man who called said his superiors sort of looked upon service as an incidental department of the business. Sales have been good on new cars and so the service department is tolerated as a necessary evil. The man made the startling statement that up to a few months ago this institution (located in the second largest city of the country) did not even have order forms and blanks in the repair shop.

He said, when a customer came in, anyone who happened to be handy looked over the car and told him what he thought ought to be done. Or, if the foreman, the "service manager," attended to the wants of a customer, he would simply call over a mechanic and tell him to take the knock out of the engine, "fix the clutch" or something similar.

Then the usual thing would happen that always happens in a shop conducted on this basis. No definite line of action was followed out. The mechanic would keep his own time, and when the customer came in for his car the foreman would ask the mechanic about how long he worked on the job and then a bill of some kind would be made up for the customer. Naturally, in the majority of cases, the customer was ready to go through the ceiling when told what the bill was. How can you blame him?

As this man said, the service work in this establishment was just one big guess after another, and most of the time the guesses were wrong. That is why he looked to the flat rate system for a solution. It at least would offer a definite job to sell to a customer. This place has some good mechanics, and the trouble heretofore has not been in delivering the work, but in the sell of it. It was the old story of trying to deliver before we sell.

We submit that the time is here when service and maintenance will be sold in a salesroom pretty much like our present-day new car salesrooms. True, the customer will drive his car into this room just as he now drives into the "service department." But he will not see a bunch of dirty mechanics or empty oil barrels, nor will he run the risk of breaking his neck from slipping on a shiny, greasy floor.

No. The service sales department that is to come, and already exists in some isolated cases, is the one wherein the customer will be handled in much the same manner as he now is handled in the new car sales department. And the service sales manager will have competent salesmen under him, who, knowing the psychology of selling, will make the customer as much at home in this department as he is in a department store.

These service salesmen will be totally divorced from the "shop" proper, as we may designate the place where the actual work sold by the salesmen is performed. There ought never be an occasion for the customer to be brought in contact with the mechanics or the shop, no more than there is for a hotel guest to be brought into contact with the dishwasher in the kitchen.



"No one would expect to go into a high class restaurant and find the manager out in the kitchen dishing out soup"

We ourselves are to blame that the motoring public looks upon the service end of the business in an unfavorable way. You who have taken vacation trips this summer, let me ask you what is your impression of the average garage in the small town, yes, and in the large ones too? You know that the average place is a messy looking affair at best. Some present a fairly decent looking show window, but when you enter the door and get inside!

Just the other day the writer entered such a place, and there right in the doorway was a mechanic under a car lubricating the springs with a big paint brush. He wasn't a bit careful how he swished the brush about, and before long there was as much oil on the floor as on the springs. And all this was going on right in the entrance where every customer would have to pass.

Again we say the time is here when this sort of thing must be relegated to a department out of sight from the customer. He must be sold the operation on a definite basis, in a department entirely apart from the department where the work is done. He must not see the actual operations, nor is it important that he should. All that he asks is that the work be done right, and on the same basis to which he is used to in other lines.

DAWZ DIARY

SEPT. 6. Me and Art has been tawking a good eal about going into bizness for ourselves but we cant deside wether to stay in this town or go some whares else me thinking Gee this is the bestplace becus agood meny peepke knows both of us here and if we was to go somewhere else we would half to start without any body knowing whether we was eny good or not.

Art thinks we auto go to a bigger place me saying if we get all the bizness there is here we would be going some.

I got at least a 100 people around here wich i bet likes me better than the Boss and mabe they would be 200. Anyhow the Boss aint such a popular guy as he thinks he is. The truble with him is that he treets people fine when hes

tawking to them but he shure soaks them all they will stand me thinking its much better to be onest with every budy and tell them just what your doing.

Lots of guys around this town know i think about them things and i bet a lot of them would give me a try specially if we was to have a nice looking shop thats the truble neither of us aint got no money to equip a shop except what Art thinks he can get from his dad wich i hope he can becuz i aint got no budy wich can lend me nothing all my fokes being hard up.

Anyhow we aint going to go of haffcocked and we wont start before next spring mabe we can save up a little i know a few jobs i can get on the outside only if the boss finds it out Good Nite ill half to start in for myself right away or get a new job.

DOING ONE THING WELL

WE have long preached the gospel of keeping the customers' cars clean while they are being worked on in the service station, and in line with this we saw something the other day which might be applied to advantage by every service station. The better class shops make it a point to cover such parts as fenders, running boards, seats, and so on, but who thinks of the control levers?

The service station we have in mind had made up several small bags a little larger than an ordinary tobacco bag and these bags were slipped over the control levers to keep them clean. Most of us make it a point to keep the steering wheel clean, but we sometimes forget that the customer must use his control levers.

New Series of Moon Six Cylinder Cars

*Better Manifolding and Heating of Incoming Charge Feature of Engine.
Timken Rear Axle Now Has Centralized Carrier*

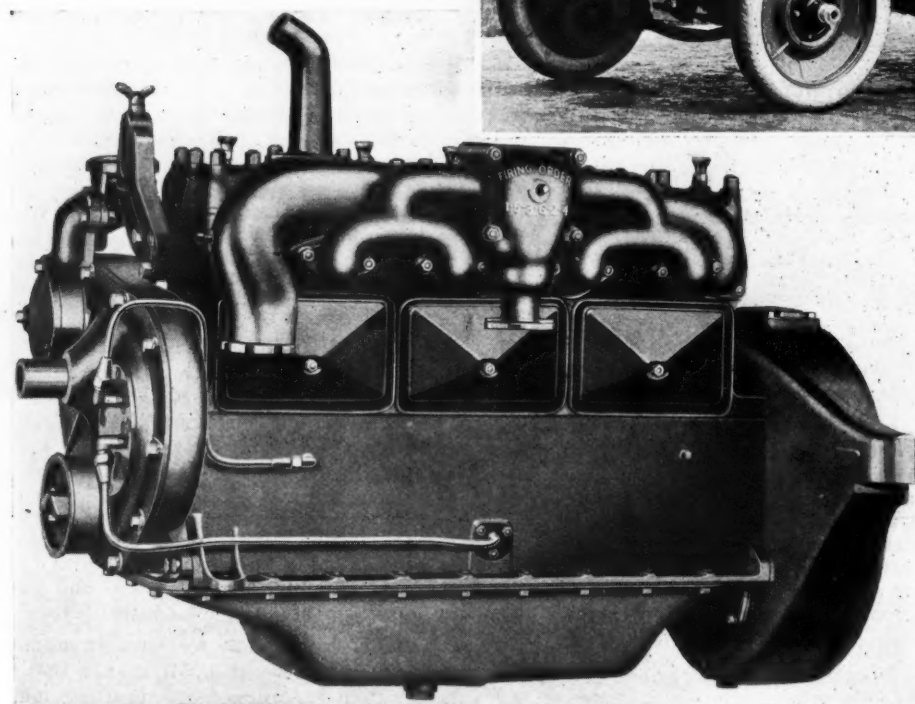
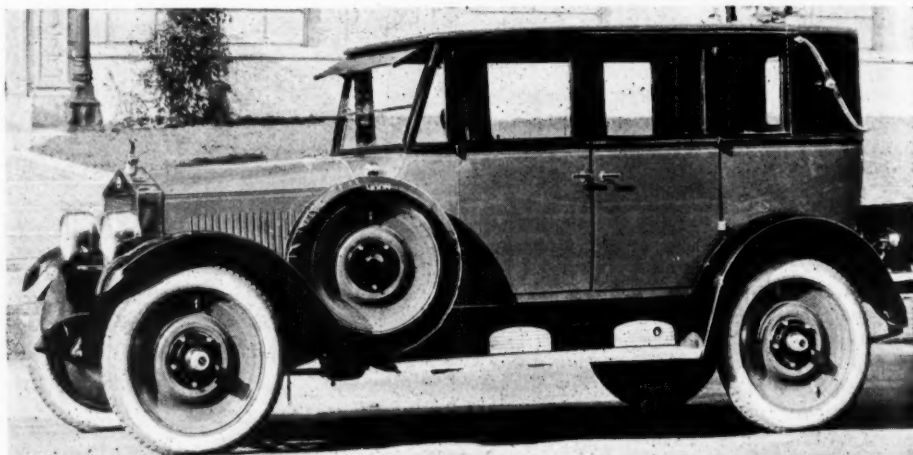
THE Moon Motor Car Co. announces a complete, new line of six-cylinder cars, known as New Series "U" Six 40 Moon, embodying refinements of the engine, manifolds, transmission, rear axle, but retaining its former body lines and familiar radiator contour.

Outwardly the appearance of the cars in the new series is identical with those of the previous series, but close inspection of the engine and other mechanical units reveals numerous refinements that make for greater fuel economy, smoother operation, balance and pronounced increase in pick-up and power.

The new series is powered with a new Moon-Continental engine. It has a new type connecting rod, together with a "spun-bearing" which it is stated, assures a perfect fit to the crankshaft. The pistons are a new type of casting, produced by a new process of machining.

The wrist pin bosses are drilled and have oil grooves cut in them which assures complete lubrication of the pin. The crankshaft, side bosses and both the main and connecting rod bearings, have been made very deep. A new type tapet, accurately ground, is used, together with a new type plunger and spring.

Another feature of the new series is a water manifold, controlling the supply of water to the cylinders. This mani-



The new series "U" Six 40 Moon-Continental engine. This shows the manifolding in which the intake charge is preheated by the hot exhaust gases

fold, assures a uniform temperature on top of all six cylinders. It also assures efficient winter-time operation. The carburetor intake manifold is of improved design, operating in connection with the

hot exhaust, so that the gas is pre-heated.

An important improvement has been made in the rear axle. The new Timken rear axles are of "centralized carrier" type, permitting the use of a flat bevel

New series "U" Moon sport sedan and touring model. The body lines, as will be noted, are the same as in former models. The chassis has a wheelbase length of 115 in.

ring gear instead of the bell type. This change is made because of the fact the bell-type ring gears cannot be as true as the flat type and moreover the bell type magnifies any noise or hum that might exist, it is stated.

The pinion shaft is straddle-mounted. Attention has been given to the matter of efficient brakes, and as a result the new series "U" cars have brakes designed on the multiple leverage system.

The transmission gears are larger in diameter, heavier and aligned so that practically all noise and vibration is eliminated. This improvement is especially noticeable when the cars are driven at high speed in second gear.

The new series "U" Models sell at the following prices, which are f. o. b. St. Louis: Touring, \$1295; Sport Touring, \$1495; Roadster, \$1295; Coupe, \$1585; Sedan, \$1695; Sport Sedan, \$1895.

All models are upholstered in genuine Spanish leather and come in Marine Blue, Milori Green and Lake Maroon.

1924 Oakland Six Completely Redesigned

New Chassis Has Four-Wheel Brake System and L-Head Engine With Ricardo Type Combustion Chamber. Controls Removed From Instrument Board to Center of Steering Wheel. Body Lines Substantially the Same as in Former Models

CO-INCIDENT with the adoption of four-wheel brakes, the Oakland Motor Car Company have brought out an entirely new car. The former overhead valve engine has been supplanted by an L-head engine having a combustion chamber of the commonly known Ricardo type which induces maximum turbulence. The same bore and stroke have been retained but the turbulence feature, in combination with other improvements, has resulted in an increased maximum power output throughout the entire speed range. The frame has been stiffened, particularly against torsional deflection, by the use of thicker side channels of lesser depth and the addition of cross members, including a tubular member between the front spring horns.

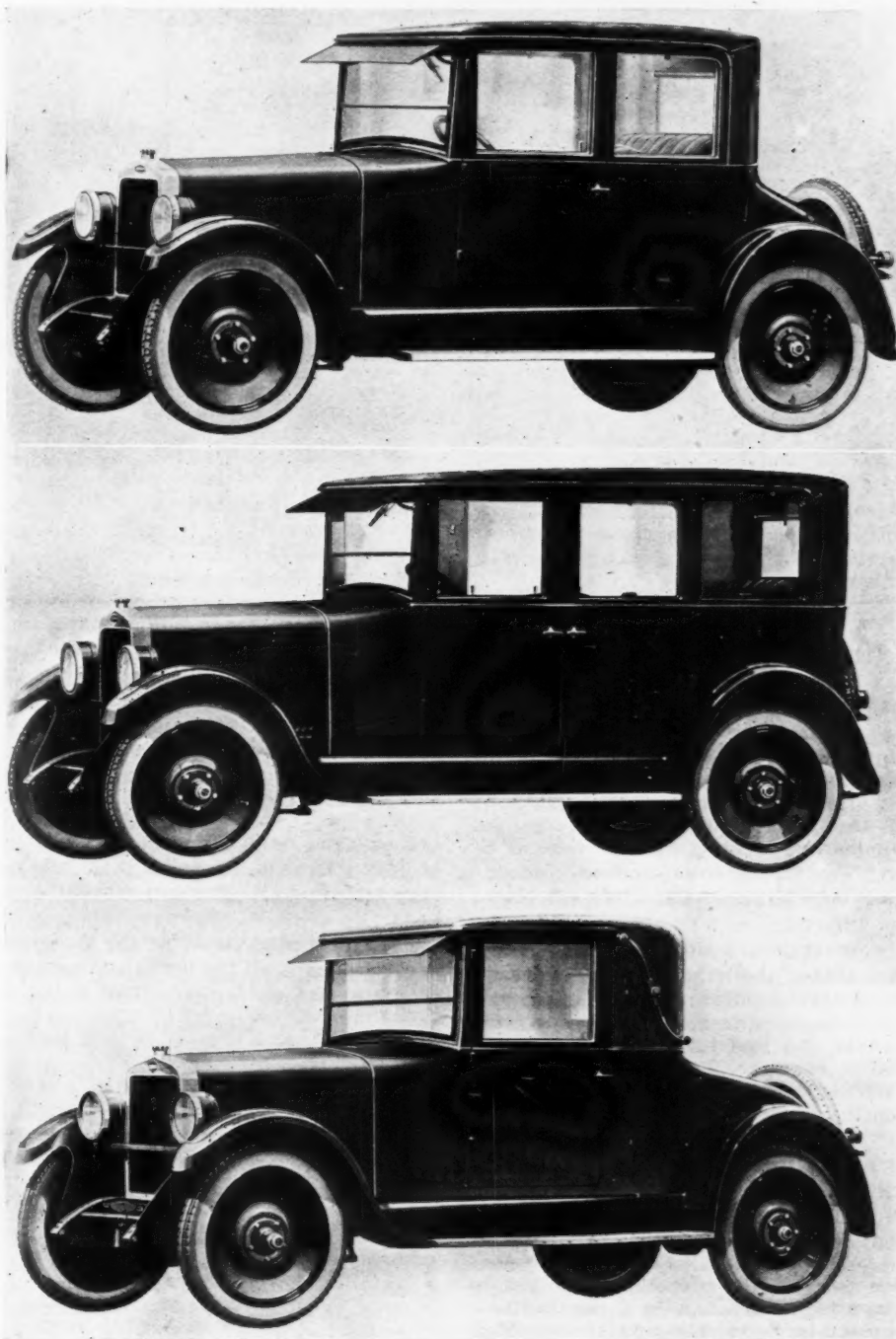
The company is now in part production of its new models and will reach full production during the month as its factory equipment and conveyor systems are completed. The factory has been completely changed as regards production layout and will have capacity of about 300 daily when fully under way, present output being limited for the time being to about 100.

New Fisher Plant to Supply Bodies

The new Fisher body plant which has been built about half a mile from the factory at Pontiac will get into operation about the middle of September. For the present the company is bringing its bodies by truck from the Fisher factories at Detroit. The Fisher Pontiac plant will be devoted exclusively to Oakland work and will give employment to about 4000 operatives.

As a publicity feature in connection with the new line the company is starting out six of its new models which will be run to six cities at extreme points in the United States. The feature of this publicity will be a demonstration of the performance of the new car under any and all road conditions as encountered in different sections of the country.

New mechanical units are found throughout, each having been designed to correlate exactly with the new engine and the four-wheel braking system. The total weight of the gear box is somewhat less and the gears and bearings are layed out to fulfill the demands of the increased power characteristics. A 9 in. open type Hoosier clutch is the connecting link between the engine and the gear box, which now carries a 6 in. diameter emergency brake at the tail shaft. The semi-floating rear axle is made not only lighter but stronger. In spite of the addition of four-wheel brakes, the total weight of the car is within a very few pounds of that of the former model.

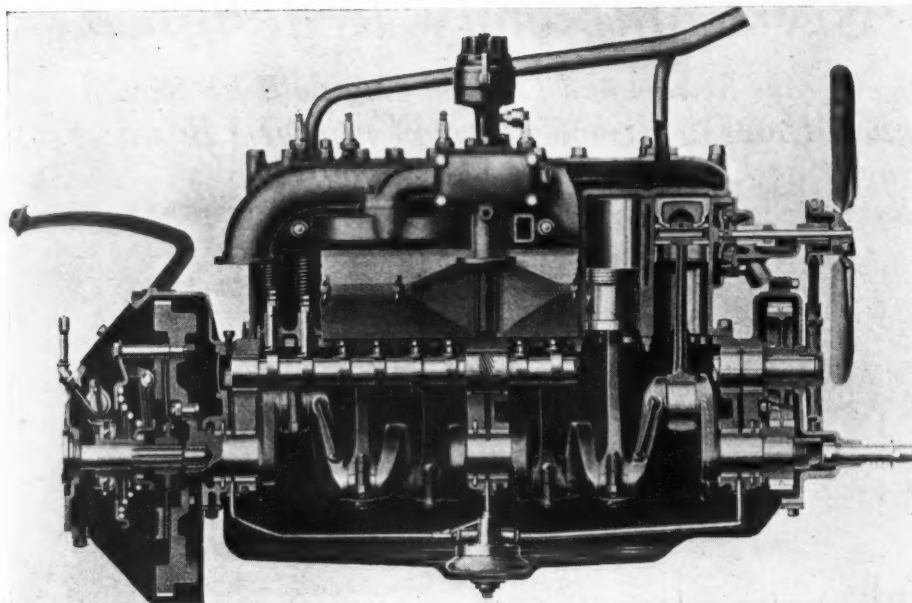


In its line of closed models Oakland has the above three consisting of the four-passenger coupe, the five-passenger sedan and the business coupe

In addition to the mechanical improvements, several new features are to be found in the new bodies. All controls have been removed from the instrument board and are now located in a single unit at the top of the steering column. A single rectangular glass panel at the center of the instrument board encloses

the ammeter, oil pressure and gasoline gages with interior illumination.

The frame height has been lowered and the open body sides have been made higher, making for better protection from dust. A new type of close-fitting glass enclosure is designed to be installed with the permanent tops on all open models



This shows the three-bearing crankshaft and oiling system of the new Oakland engine. Note also the provision made for lubricating the clutch throwout bearing

as extra equipment. By this arrangement the same car offers all the advantages of the open car for summer driving with neat, built-in protection for winter service. These panels can be installed in a few minutes at any time.

The Four-Wheel Brake System

The four-wheel braking system, which has been adopted, is different from any other now in operation in this country. No equalizers are used as all four brakes are adjusted individually. The linkage to the front wheels is designed to compensate for the natural transfer of weight to the front end during retardation, eliminating locking by the release of pressure at the front brakes. In conjunction with this feature, the centers of the universal joints that actuate the front brakes rotate in a slightly different plane than that of the knuckle center, to cause an increased release of the outer brake while making a turn. A detailed description of the system will bring out the ability of these features in preventing skidding or loss of control of the car due to locking of the front brakes.

A single rod connects the pedal lever of approximately 13 in. effective radius with the lower end of a lever clamped on a tubular cross shaft which is located under the intermediate crosschannel. The cross-shaft is swept up at its central portion to clear the propeller shaft and is supported in bearings at three points, a bracket being riveted into the inverted channel adjacent to the operating lever and brackets riveted at each side where the cross shaft passes through the side channels.

Double ended levers are mounted at each end of the cross shaft. The upper end operates the front brakes through an intermediate linkage, while the lower end is connected by a link to an intermediate operating lever mounted on the rear axle. Although the two ends of the lever on the cross shaft are of different lengths, the relative lengths of the intermediate lever

arms is such that the theoretical pull at all the brake band levers is identical.

With this arrangement all of the brake operating linkage, with the exception of the first link and cross shaft already mentioned, is located outside of the frame but at the same time is concealed by the shroud between the running board and body. External band brakes are used at all four wheels, the outside diameter of the drums being $12\frac{1}{4}$ in. and the width of bands $1\frac{1}{2}$ in. The rear bands have approximately a half wrap, while the front bands have a five-eighths wrap, for reasons which will be covered in the discussion of the operation of the front brakes. The detail design of the two sets of brakes is much the same, both following rather well known conventional lines.

The intermediate lever on the rear end is carried, as is all the brake mechanism, on a stamped steel plate. This lever is

connected by a short pressed steel link to another lever, which in turn operates the brake band clamping lever through another pressed steel link. The usual release spring and hand adjustment are located in front of the axle. A support in the form of a slotted eye belt carries the reaction of the releasing spring and tends to eliminate rattling. Additional radial releasing springs are provided in the anchor bracket and two auxiliary supports.

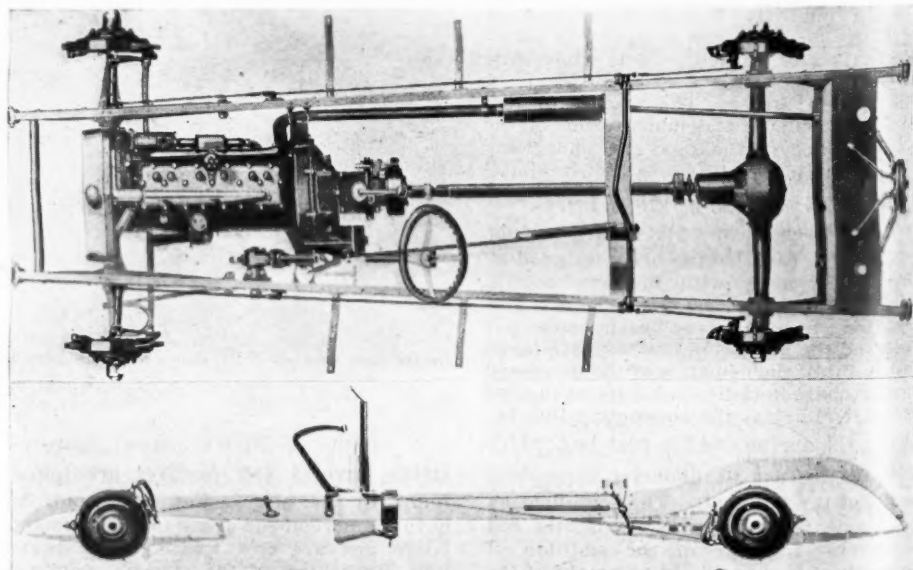
From the upper end of the cross shaft lever, a link, having an integral clevis at each end, extends forward to an intermediate idler lever which is carried on a bracket riveted to the side channel alongside of the rear pair of cylinders. For simplicity's sake but one side will be described. Another link, having a spherical surface at the front end and a threaded yoke at the rear end, connects this idler lever with the inner brake operating lever of the floating connection between the frame and the front axle.

The lower leg of the outer fork of the universal joint is extended to form a lever which extends downward and operates the brake band clamp lever through an intermediate link. This fork is forged at the inner end of a short shaft which has its bearing in a bracket riveted into the stamped steel brake carrier and cover. A helical spring surrounds this bracket and, because of its application to a washer at the end of the short shaft, serves to prevent rattling and returns the lever to the release position.

Front and Rear Brakes the Same

Beyond the clamping lever, the details of the brake are substantially the same as those of the rear construction with the exception of the anchor location, which is moved around to provide a five-eighths wrap.

The center of rotation of the universal joint is in a plane which is several degrees off of that of the steering pivot, the latter being inclined so that its centerline subtended is $\frac{3}{4}$ in. inside of the cen-



Plan and side elevation of the Oakland chassis, showing the general layout and operating mechanism of the four-wheel braking system. The hand brake is located on the drive shaft

ter of the tread. The operation in different planes results in a slight relative motion of the brake operating linkage as the wheel is moved around. This motion tends to release the outer brake while turning a corner and therefore eliminates the possibility of sliding straight ahead, due to a locked outer wheel.

Locking of Wheels Prevented

Locking of the front wheels is prevented in a novel way which utilizes the natural sequence of cause and effect as the brakes are applied. With any system of brakes, weight is transferred to the front axle during retardation. This increase in weight naturally causes an increased deflection of the front springs. In this design the link connecting the idler lever beside the rear cylinders to the inner lever at the front end slopes downward at a considerable angle from rear to front. As the springs deflect, this link swings upward about its rear center and tends to release the inner operating lever and consequently the brake, by a slight amount.

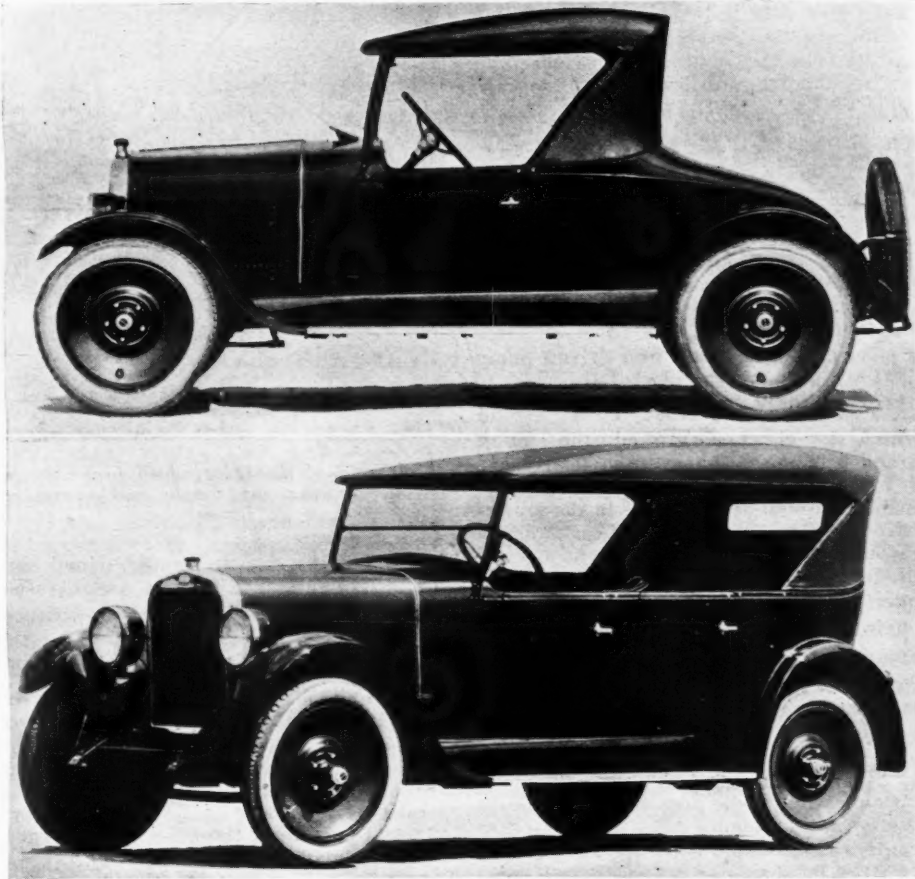
This feature constitutes the reason for the increased wrap of the front brake bands, compensating for the slight decrease in tension at the band during normal application of the brakes.

The same feature holds good upon sudden extreme application of the brakes. As there is no equalizer in the system, the maximum travel of the pedal is limited by the contact at the rear bands as well as those in front. The transfer of weight sets up a proportional deflection at the front springs and simultaneous decrease in braking moment. The front wheels may approach but never attain a locked condition.

The included angle between the inner operating lever and the brake rod is the determining factor rather than the angle between the rod and the frame. A slight angular movement of the rod brings about a very appreciable movement of the brake lever. The makers state that this system has shown excellent handling qualities with any reasonable brake adjustment. The line of action of the front springs, with reference to the axle support, is inclined slightly back of vertical. This angular travel in opposition to the brake rod insures the releasing action.

In addition to the service or foot brake facilities, a hand lever operated brake is located at the rear of the gear box. A 6 in. diameter pressed steel drum is centered on a cast spider which is splined on the rear end of the tail shaft. A double acting band brake of 2½ in. width engages with this drum, being actuated by a compression link from an L-shaped extension of the lower end of the hand lever.

As described, two separate and individual braking systems are provided, each being absolutely independent of the operation of the other and effective in either direction of the car's motion. The conditions affecting the operation of the four-wheel brakes in the forward direction are reversed and produce similar results when applying the foot brakes as the car is moving backwards.



Two of the new Oakland open models—top, three-passenger roadster, and below, the five-passenger touring. Although the cars are entirely redesigned, the exterior body lines are the same as the preceding models

While the same bore and stroke, 2-13/16 in. and 4¾ in. respectively, have been retained, the six cylinder engine has been entirely redesigned. The former overhead valve construction has given way to an L-head design. It is stated that this change alone has resulted in decreasing the number of parts incidental to the valve operation mechanism by 124 pieces. The maximum power output over the entire speed range and performance, particularly at the lower speeds, has been materially improved by the use of one of the Ricardo-type combustion chambers. This space is formed to promote maximum turbulence and localize the greatest portion of the compressed charge adjacent to the spark plug. Emphasis has been placed on performance at driving speeds rather than utmost maximum speed.

The cast iron crank case is now split 2-5/8 in. below the center of the main bearings for greater rigidity of bearing and bell-housing installation. Cylinders and valve tappet guides are cast separately and belted to the upper face of the crank case, the tappet guides being cast in groups of six. As the total depth of the crankcase is in excess of 8 in. and the bell housing is cast integrally, a rigid structure is insured. The bottom of the crankcase is formed by a pressed steel pan having its greatest depth and drain plug at the center adjacent to the oil pump.

Crankshaft sizes have been increased throughout, the three main bearing con-

struction having been continued. The dimensions of the main bearings are:

	Dia.	Length
Front	2 in.	2 in.
Center	2-1/16 in.	2-1/8 in.
Rear	2-1/8 in.	2-3/16 in.

End thrust is now taken at the front main bearing by collars consisting of split halves at each end of the journal. The lower halves of these collars are supported in turned recesses in the bearing cap and rotation is prevented by dowel pins. The upper halves rest on the lower halves so that all may be removed by dropping the bearing cap. Two different thicknesses are used permitting three possible combinations which limit end play in the range of .0035-.0065 in.

Bearing Specifications

L

The main bearing shells are bronze-backed and lined with a thin layer of babbitt. These bearings are made by the Chadwick process, in which the bearing is burnished to size before delivery to the engine plant and is not touched thereafter. Limits are maintained within .0005 in. and the crankshaft is ground to a corresponding accuracy to produce an oil clearance of .001-.002 in.

Lower connecting rod bearings are 1-7/8 in. dia. and 1½ in. long, being lined with a cast in, tin-bonded babbitt. Oil holes are drilled in the crankshaft from the main bearings to the adjacent rod bearings and copper tubes convey the supply from throws 1 and 6 to 2 and 5 respectively. The main bearing shells

are provided with annular supply grooves that index with the ends of the oil holes leading to the red bearings. No shims are used in any of the full surface type bearings on the crankshaft. Oil is supplied by a gear pump located in the bottom of the pan, in the plane of the center main bearing, and driven by a vertical shaft and helical gear from an integral helical gear at the center of the middle bearing of the camshaft.

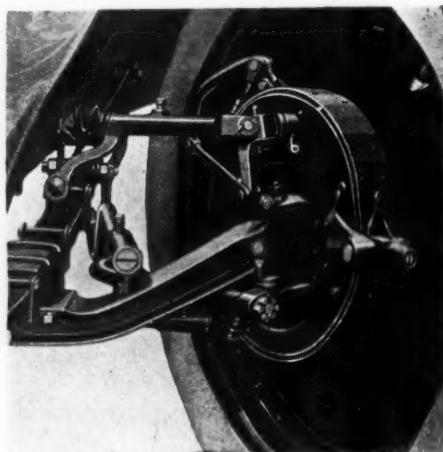
A cast iron pump bracket, which is belted to the lower surface of the crankcase, carries a die-cast pump housing that, with a pressed steel cover encloses a steel driver and cast iron driven pump gear. An inverted filtering screen is sweated into a pressed steel shroud which is clamped around the pump bracket flange. Copper tube leads convey the oil to three main bearing caps, thence through drilled holes in the crankcase webs to the camshaft bearings and through the drilled crankshaft, as already described, to the connecting rods. A nozzle discharges constantly on the silent chain sprocket on the crankshaft and an adjustable pressure regulating valve is located at the front end on the left side. Tappets and cylinder walls are lubricated by the splash from the lower rod ends.

Connecting Rod and Piston Specifications

Connecting rods are of light I-beam section and measure 8-7/8 in. center to center. The lower caps are retained by two 3/8 in. diameter bolts. A full floating piston pin, of 3/4 in. diameter, has its outer bearings in the light alloy piston and the inner in a bronze bushing, of 1-1/16 in. length, which is pressed into the upper end of the rod. Snap rings prevent excessive endwise travel of the piston pin. The piston is of the split skirt, constant clearance type having the skirt insulated from the heat of the head by sawed slots below the lowest ring. Two 1/8 in. wide concentric rings are located above a two-piece sealing ring of 3/16 in. width, all being located above the piston pin. Liberal water space is provided all around the valve seats and flame swept portion of the cylinder barrels which are finished by the honing process.

The detachable head bolts onto the cylinder block with an intermediate copper asbestos gasket, flush with the top-most position of the piston head. The combustion chamber, as shown herewith is located entirely within the head and liberally water-jacketed. Spark plugs are located in recesses which are completely surrounded by water, approximately above the intake valves. The water supply is returned to the radiator by a three pipe manifold bolting to the top of the head.

The valves, which lift 5/16 in., are 1 1/4 in. in clear diameter and inclined at a 4 deg. angle on the right side of the engine. Both valves are of the integrally forged type, the intake being made of 3 1/2 per cent nickle and the exhaust of silicrome steel. Cast iron valve stem guides, which are 2-15/16 in. long and reamed to 5/16 in. inside diameter, are pressed into the cylinder block. The



A close-up of the front wheel brake mechanism, showing the toggle and operating levers

springs are retained by the usual cup and C-clip and are 2 1/4 in. long at the closed position of the valve.

The mushroom tappets are 9/16 in. diameter at the shank with a set screw adjustment at the upper end. Six of these tappets are carried in each of two cast iron brackets which are bolted on the cylinder mounting surface. The valve adjustment is enclosed by pressed steel covers seating on the cylinder casting and butting at the center on the tube around the distributor drive shaft.

The camshaft, which is 1-13/16 in. diameter between bearings, is carried on three pressed-in cast iron bushings, the dimensions of these bearings from front to rear are:

	Length	Dia.
Front	2-3/16 in.	1-15/16 in.
Center	2-1/8 in.	1-7/8 in.
Rear	1-3/8 in.	1-3/8 in.

The oil pump and distributor drive gear is cut in the middle of the center bearing and is approximately 13/16 in. wide. End play of the camshaft is taken at a steel plate between the silent chain sprocket and the face of the front camshaft bearing. An assembled cast iron and pressed steel pulley, which is keyed on the camshaft at the front end, drives the fan and water pump through a 9/16 in. diameter belt.

Water circulation is obtained by an impeller mounted on the rear end of the fan shaft and projecting into the water jacket. A bronze bushing, which is threaded for an external packing nut, carries the impeller lead. A second bronze bushing is located inside of the cast iron fan drive pulley. The fan spider is now belted to the pulley that is in turn pinned and keyed to the shaft. These two units are driven at approximately crankshaft speed.

A Stromberg 1 in. Model OE carburetor with accelerator well supplies the mixture to the two-piece, external intake manifold. A short vertical pipe connects the carburetor with the heating chamber at the center of the inverted branch pipe. A hot spot is formed by belting the inner portion of the T-branch directly to the exhaust manifold. The inverted

branch pipes swing downward and are belted to the fore and aft, distributing manifold of square section.

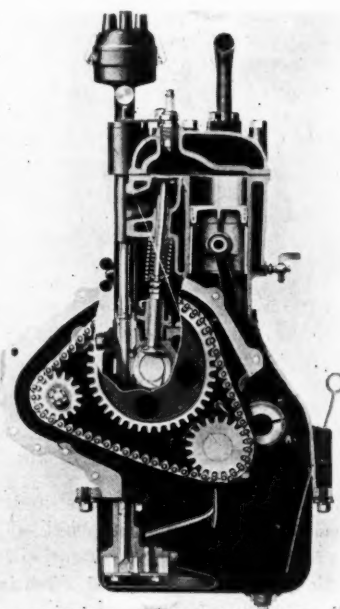
Siamesed ports are provided for cylinders 1 and 2, and cylinders 5 and 6 respectively and individual ports supply cylinders 3 and 4. Practically no radius or fillet is found around the edges of the intersecting passages and the square section is blended into circular sections at the ports, it being stated that these provisions tend to prevent deposition in the manifold passages and therefore bring about good distribution of a well prepared mixture. The exhaust manifold has its outlet in a horizontal flange at the rear end.

The electrical system is Remy throughout with the full automatic advance distributor placed above the cylinder head and driven by an upward extension of the oil pump drive shaft which is enclosed in a steel tube at the center of the right side of the engine. The thermostatic controlled generator is driven at the third point of the triangular silent chain front end drive. The generator is driven at 1 1/2 times crankshaft speed. The silent chain tension is adjusted by tilting the generator mounting pad about the lower belt of the three point flange.

The starting motor is mounted back of the clutch bell housing below the horizontal center line near the top of the block at the right side of the engine just across from the distributor head. Short high tension leads connect the distributor head with the 7/8 standard spark plugs.

Clutch Is Open Type Hoosier

An open type Hoosier 9 in. clutch transmits the power to the gear box. The clutch and flywheel are enclosed in a cast iron bell housing member forming the rear engine support, and a pressed steel bottom cover. The clutch pilot, at the foreward end, is a graphite bronze



End sectional view of the Oakland L-head engine, showing the Ricardo type combustion chamber, inclined valve and chain front end drive. Note the large water passages

bushing which is pressed into the rear end of the crankshaft. An extension, projecting above the floor boards, terminates in a Zerk fitting for the lubrication of the clutch throughout ball bearing.

A feature of this clutch is the thin steel driving plate which carries the two friction discs. As this bell housing member carries the pedals and forms two engine supports, the third is located under the starting crank jaw barrel of the gear case cover in the form of a two bolt pad.

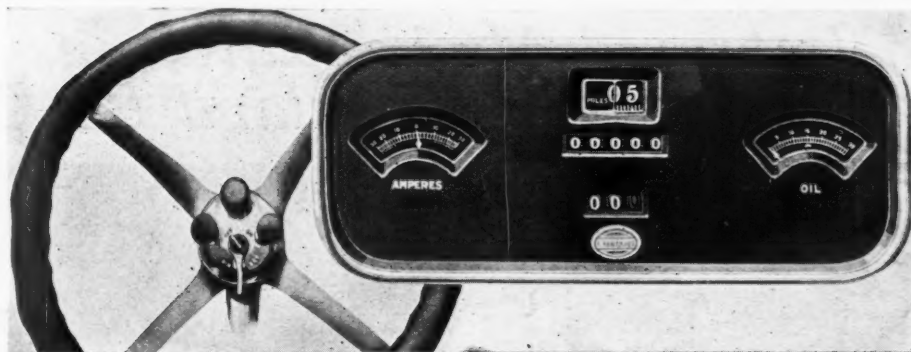
The gear box, which is centered and bolted on at the back of the clutch bell housing member, is conventional in design, although somewhat lighter in weight than the former installation. Annular ball bearings carry the upper shafts with a bronze bushing at their telescopic joint. The counter shaft assembly is built up on the long barrel of the reverse pinion and carried on pressed-in bronze bushings. A novel feature is found in the design of the gear shifting gate rods and yokes. The sliding rods are replaced by flat plates having the shifter yokes formed integrally. A Yale lock is mounted in the cover back of the shifting lever support. The speedometer drive is taken off just ahead of the rear flange which carries the transmission brake drum and forward universal joint.

Universal Joint and Axle Design

A tubular propeller shaft and Mechanics universal joints drive the semi-floating rear axle. The axle is the pressed steel banjo type with a malleable gear carrier belted in front and a pressed steel inspection cover at the back. The pinion shaft is carried in a two-row annular bearing mounted in an adjustable cage, and a single row bearing adjacent to the pinion. Thrust type bearings with individual adjustments are located each side of the bevel gear differential, all being New Departure bearings. A spiral bevel combination of 4 7/10 ratio is standard equipment. The live axle shafts are retained by split washers at the inner ends of the equalizing gear hubs and are carried in Hyatt high duty bearings at the wheels. Disc steel wheels carrying 31x4 cord tires, which are now standard equipment on all models, are centered on malleable flanges that are in turn mounted on the tapered axle ends.

Hotchkiss drive is used and the rear springs, of the same length as formerly, are flat under load and fitted with rebound leaves above the main plates. The front springs, although of the same length as the former models, have been reinforced for operation with the front wheel brakes and are flat under load. Steel jacketed bronze bushings are used on all spring eyes.

The depth of the frame has been reduced to 5 in. from 6 1/2 in. and the thickness of the side members has been increased to 5/32 in. With the addition of the tubular cross member in front, the frame is now much stiffer, particularly in torsion. Five cross members are formed back of the front tubular mem-



Oakland on its new models places the choke, gas button, horn button and lighting switch in the hub of the wheel. The ammeter, speedometer and oil gage are in a panel on the dash, indirectly lighted

ber, the radiator channel support, the bellhousing member and its steel supports, the inverted channel over the brake cross shaft, and finally, the gasoline tank support, which is a broad steel plate riveted to both upper and lower channels for a considerable length. The wheel base is now 113 in. and the frame side members taper in straight lines from front to rear instead of being offset as in previous models.

The front axle is I-beam with over-mounted springs and fully enclosed steering pivot, having been reinforced to carry the stresses incidental to front wheel braking. The reverse Elliot knuckle carries the front wheels on New Departure thrust type bearings. Steering arms are secured in bevel tapered holes and both drag and cross links are of straight one-piece tubular construction with leather lined steel protectors at the ball joints. All Distel wheels are secured to the hub flanges by clamping rings and five bolts.

Control Head Is Unusual Feature

An unusual feature is the control head which is now located at the top of the Jacox steering gear. An aluminum bracket carries the horn button, telescopic choke and throttle buttons on square shanks, a three-position light switch and the ignition switch. This bracket is clamped to a steel tube which extends up through the steering column and contains the various electric wires, all in a loom conduit, and the two steel wires forming the choke and throttle controls. At the lower end of the steel tube these steel wires are extended into tubes which carry them around the front end of the engine to the carburetor.

To inspect electrical connections underneath the control head, it is only necessary to loosen the clamp bolt at the bottom of the steering gear housing and push the entire tube up, exposing the entire assembly. The steering wheel is built up of an aluminum spider and a wood rim. The control head does not rotate with the wheel but remains stationary at all times. The steering gear is lubricated by a Zerk oil gun at a special connection. This equipment has been standardized throughout the entire chassis and external lubrication points of the engine.

Although the characteristic radiator and hood lines have been retained, all

types of bodies have been revised and improved. Appearance has been enhanced by the lower frame height and open body sides are higher than formerly. In addition all bodies are somewhat wider, particularly at the cowl and in the front compartment. The rear corner line of the open five-passenger models has been rounded and outside door handles have been added.

Particular attention has been given to weather-proof enclosure of all open models. Permanent tops are now standard equipment throughout. These tops are fitted with a substantial weather strip below and inside of the lower edge of the permanent frame. Curtains are mounted on steel frames so that they fit to this weather strip in a neat flush manner. The quarter curtains at the wind shield are now clipped tightly around the side frames by steel springs. Rubber weather strips are placed between the two wind shield panels and between the panels and the side frames.

As an alternative for the standard curtains, a glass panel enclosure is available as an extra for all open models. These panels convert the open car into a very satisfactory closed car and can be installed in practically the same time as a set of curtains. Windows in the enclosure are adjustable and the rear panels may be swung open for ventilation. The cost of this equipment is \$60 for the five-passenger and \$40 for the roadster bodies. This form of enclosure gives the owner his choice of the type of car for different weather conditions.

Standard five-passenger and roadster bodies are finished in a dark blue color while the two open sport bodies are finished in a light blue with an orange striped bead. All open cars are finished by an enamelling process which forms a durable lustrous finish. The sport models have a top of khaki material and include as standard equipment, front and rear bumpers, rear view mirror, motometer with bar cap, visor, wind shield wings, kick plates and corrugated rubber covers on the running boards. Sport models are upholstered in blue figured leather and the standard open models in black leather.

The enclosed line includes a five-passenger sedan, a four-passenger coupe and

(Continued on page 22)

Improved Mechanical Units Feature New 1924 Cleveland Six Models



IMPROVEMENTS in the valve actuating method, increased performance and flexibility of drive, better handling of the fuel and several other notable improvements in the mechanical units feature the 1924 Cleveland Six models.

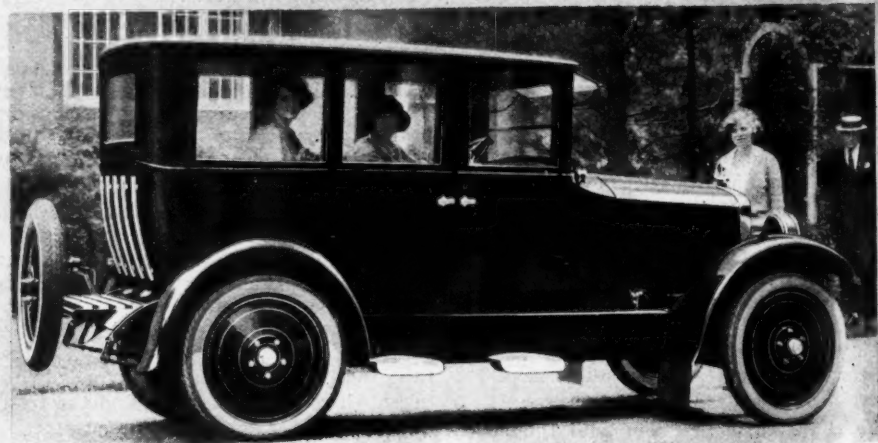
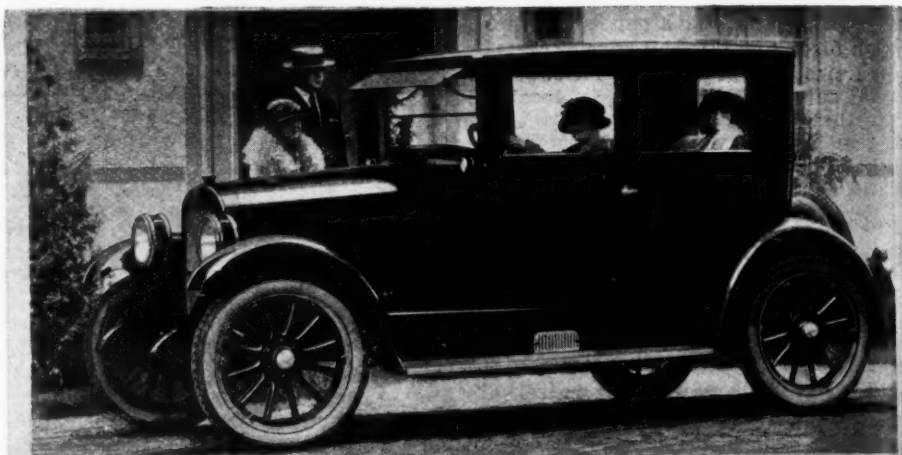
A new automatic spark advance on the Bosch ignition system contributes largely to the rapid acceleration and better gasoline distribution has been realized through the adoption of a new type Stromberg carburetor coupled with heat application to the intake manifold. This not only is said to increase power but make the car more economical to operate.

Much of the efficiency of the new valve actuating mechanism can be laid to a new valve lubricating system. Pressure forces the lubricant from the main oil line to the valve rocker arm shaft and by centrifugal force it is forced through a groove in the rocker arm to a felt oil retainer.

All valves and their seats are completely surrounded by circulating water which eliminates the possibility of sticking valves and valve distortion at high speeds. Double valve springs are used to insure positive and quiet operation. The period of vibration of each spring is different, consequently valves are not held open due to a vibrating valve spring.

Ease in chassis lubrication has been facilitated by the introduction of an air automatic high pressure oiling system, which forces the oil down to the bearing surfaces. The fan, too, is now self-lubricating. An oil drain at the side of the crank case permits the oil to be drained without crawling underneath the car.

Timken roller bearings are now used throughout. Steering has been made easier by the adoption of a steering knuckle containing a ball bearing assembly which allows the lubricant to be retained for long periods as well as elim-



The new Cleveland line includes the two-door sedan, sport phaeton and special four-door sedan shown above

inating any possibility of absorption of dirt and water. A new type tie rod provides take-up of wear after long use. The ball bearing disc type clutch is larger and now affords a ten-inch contact surface.

Although the body lines of the new series Cleveland Six remain unchanged, the appearance is enhanced by a new and more distinctive radiator design. Aluminum kick pads are an innovation with all running board models. The touring deluxe and sport models now

carry a wide stripe of contrasting color edged with gold.

Nine models comprise the entire line, four open and five closed types: the touring, touring deluxe, roadster, sport model, two-door sedan, four-door sedan, special two-door sedan, special four-door sedan, and coupe. The two-door special sedan is furnished in five distinctive colors: beige brown, delft blue, simplex green, maroon and red. The roadster is surrey green with cream colored wheels. All other models are in Cleveland blue.

Bill Fixit's Return

Bill Takes the Monthly Inventory and Gives a Lesson on Ignition Coils and Distributers

By A. H. PACKER

Previous articles in this series were published February 15, March 8, May 3, May 31, July 5, and July 26, August 16, 1923

ASPORTY roadster and a sedate sedan showed up to advantage in the well-lighted showroom. There was a scene of activity back in the stockroom, but the front door was locked. It was the night of the monthly inventory, and all hands were on the job, for on these occasions Bill excused no one. From the colored porter to the best salesman, all had to pitch in and help.

Bill was a thorough believer in running a business that gave satisfaction to his customers, but he also wanted to make money doing it. More than that, he didn't figure that once a year was often enough to check up on his business efforts to see whether things were going to the dogs or in the other direction.

He had all sorts of respect for accounting systems and kept his own records so that on a minute's notice he could tell how many batteries he had sold last month, and what each department had meant as to profit and loss, but when it came to depending on a perpetual inventory to tell him on paper what he had on the shelves—well—perhaps Bill was a little old-fashioned.

Platinum magneto contacts might be kept in the safe, but some one had to handle them; records might be kept carefully and the stock put under the supervision of one man, but mistakes would happen now and then under the best of circumstances. With a monthly check on the stock on hand, however, Bill could tell whether he was headed for Wall Street or "the down and out club," and he made it a point to keep the business going the right way.

So it happened that Rufus Rastus Johnson Brown was sitting on a soap box counting bushings, bearings, bolts and nuts, while the Valve Grinding Fiend was weighing up the lock washers and cotter pins with the postal scales. As each completed a tally on any one item, he put down the number or weight on a slip which went into the bin, and Hutch and Betty, coming down the line right behind them, would take the count for their inventory sheets. Betty was doing the clerical work on the job and Hutch was supervising.

All Igniters Looked Alike to Betty

"How's this?" said Hutch, noting an entry that did not look exactly right. "You have down here 15 igniters, No. 6378, 4 cyl. R.H. and under No. 6379 4 cyl. L.H. you haven't any entered."

"There's five of 'em in that bin and ten more over there," said Betty, as she puckered up her nose at Hutch.



From the monthly check of stock on hand, no one was excused. As the tally on each item was completed Hutch and Betty would take down the count on their inventory sheets

"Yes, but the five are No. 6379, the lefthand kind; you should have them in the other column."

"All right, freshly, if you want it that way, but they look all alike to me, I don't see what's the idea of having two kinds. They just do it, I s'pose, to make this little ole job harder."

"Well," said Hutch, "it doesn't make so very much difference here, where we are interested mostly in the cost of the things, for they're both priced the same, but it makes a lot of difference if one of the boys going out on a job takes the wrong kind along. The Red Head is nearly as good as Bill on this electrical stuff, but he got hold of the wrong kind by mistake the other day, and it took him quite a while before he tumbled as to what was wrong."

The Wrong Coil May Make a Goat of the Man on the Job

"Then when you come to the ignition coils you want to watch carefully for even if they look alike, the boys will get into trouble if they get the wrong kind on a car. The numbers on the base tell the story, and that's all the stock man goes by."

"I'll watch 'em," said Betty. "Red's a good scout, and I'd hate to see him get balled up on a job on my account." Betty was full of the mischief, but she was also able to stick to the business in hand when occasion required.



Rainy weather on Monday did not succeed in dimming the smile Bill wore

when he appeared for the shop conference. The inventory had shown all he expected and more. His rebuilt cars, built up to the factory standard, had kept shop, trim and paint departments filled with work so that there were but few idle hours to charge to overhead. Then the price he obtained was such that they showed a profit second only to that of the new cars. Reduction in the number of rental batteries needed had been possible with his new constant potential charging outfit, while association with other service stations in adjoining counties had made it possible to cut to a minimum his losses from bad accounts. Bill had a right to smile.

But Bill was likely to smile whether he had a right to or not, and this morning not only the good news from the inventory but a couple of jokes on the electrical gang made it hard for him to keep his face straight.

"All right," said the Red Head, "laugh if you want to, but it's funny when they make the righthand and the left so near alike you need a microscope to tell the difference."

"Perhaps you would like a palm reader and a horoscope to tell you what stuff to use, but that's all right, it was an easy one to make but, so the gang will know better, we will explain just what happened and also the trouble you get into if the right coil gets on the wrong car."

The gang was right on the job to get an ear full, for they all appreciated the joke—an easy job when it's on the other fellow.

"Now," said Bill, "I want some one to tell me what you would have to do to a single cylinder interrupter to make it right for a four-cylinder car. Valvy is getting posted pretty well, perhaps he can tell us."

"You'll need four times as many sparks as for one cylinder. Couldn't you just put four times as many bumps on the cam to make the points open four times instead of once?"

"Yes, that's part of the trick, but what else?"

Hutch finished the story. "Then you need a distributor so that all those sparks will not go to the same spark plug; you have to have them distributed to the different cylinders."

"That's it exactly, the interrupter contacts still open to stop the primary battery current and produce the high voltage in the secondary winding, but then you have to have the hot coil terminal connected to the center of the distributor cap so the spark can be sent to the right place. That means that inside the distributor, the arm must get to one of the contacts or segments just at the same instant that the cam bumps the fibre and opens the contacts."

The Way Distributer Rotation Is Figured

"We always figure on the distributor shaft rotation, looking at it from the top, and in Fig. 1 we have an igniter which seems to be made right for righthand or clockwise rotation."

"Engineers sometimes figure that it makes a difference whether the interrupter lever is pivoted at the right or left, and that it should be a certain way, depending on which way the cam is going to turn, but personally I haven't found there is much in that theory. It sure does make a difference, though, if the distributor arm is wrong or if you try to use a lefthand one on a righthand job."

"If you look at Fig. 1 carefully you will see that one corner of the cam is just ready to hit the bumper and open the contacts and that at the same instant the metal strip on the distributor arm is in line with a segment which is con-

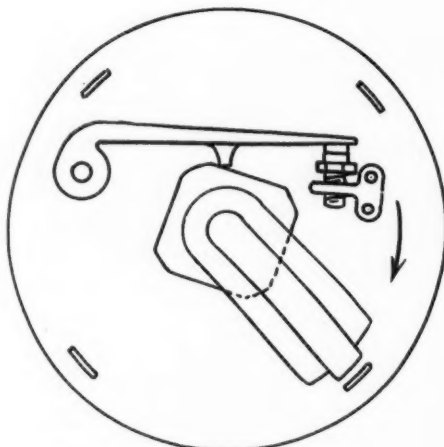


Fig. 1

Clockwise igniter. Distributer arm lines up with segment as contacts open

nected through one of the rubber covered wires to a spark plug.

"That means that the live secondary wire from the coil to the center distributor terminal will be connected to the distributor brush on the distributor arm, and because the brush is in the right place, the spark can easily jump this small gap and go to the plug and jump the gap there, too."

"Now, where Red got in wrong was in trying to use one of these on a car where the drive made it go the other way, and it gave fine sparks at the coil, but none at the plugs, although he could hear them jumping somewhere. Where do you suppose they were jumping? Red knew but wouldn't tell, and the rest were afraid to take a guess."

"Now, we will pretend that we take this same igniter and turn it the other way until the cam again hits the bumper and opens the contacts. This will make the coil generate a high voltage just as well as if we were turning it the right way, but the distributor arm will now be in the position shown in Fig. 2. Look at it carefully, fellows, and see what chance the spark has to get where it can do any good."

All Sparked Up and Nowhere to Go

"Looks like it sparks in the middle of nowhere," said Valvy. "That metal piece on the arm isn't near either of those other metal pieces."

"Now I know," said Hutch, "where the sparks Red heard were jumping. They couldn't get to a segment and then to a spark plug, so they jumped from the end of the distributor brush down to the edge of the igniter casting."

"You fellows have explained the whole works," said Bill. "Doesn't seem much more for me to add, except that you might take a look at Fig. 3 and see what they do to an igniter to make a lefthand one. The only difference is that the distributor arm is turned a bit with respect to the tips of the cam. Outside of that they're just alike, but they're a long ways from being alike when you try to use one in the wrong place."

There were no comments, all agreed

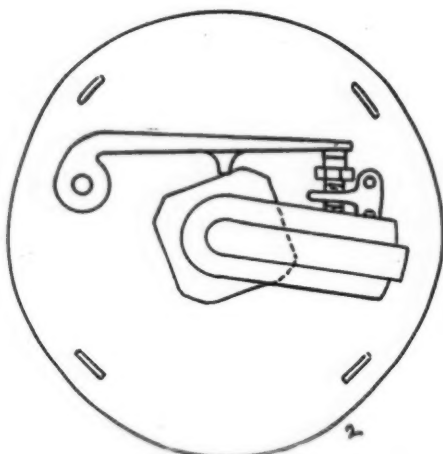


Fig. 2

Distributer arm is between segments when spark occurs with clockwise igniter, turned counter clockwise

with Bill's remarks, and it would be a long time before any of the gang bound out on an electrical job would take an igniter without checking it for rotation.

"Then when we come to the question of coils you have to be just about as careful as with the igniters. We have six-volt coils and twelve-volt coils, coils for use with open circuit interrupters and for use with closed circuit types, but they do not have much call for the open circuit coils any more. They were mostly used with the older type Atwater Kent igniters where notches on the shaft picked up a sort of trigger and, when the trigger was released, the points made contact. The time of contact was so short, however, that with the eye it was impossible to see whether they touched or not."

The Open Circuit Coil Must Build Up Rapidly

"Of course with a short time of contact, the coil had to build up pretty fast, so that such coils connected to a six-volt battery show from 12 to 20 amperes, while more recent coils, made for closed circuit interrupters, only show about five amperes."

"To see how these different coils can give similar results as far as the spark is concerned, we must remember that the only thing that affects the secondary winding, where the high voltage is produced, is to have a condition of magnetism which can be rapidly changed. The magnetism in the core of the coil is produced by battery current in the primary winding and the stronger this current the more magnetism we will get. This is not the only thing that affects the strength of the magnetism, however, for the number of turns is just as important as the current flowing."

"At our last meeting we took up the question of how the battery current in the primary winding rises slowly, because the rising magnetism generated a counter voltage right in the primary itself, and when we come to think of it, we can figure that the more turns we put in the primary, the more of this counter effect we will get, so that the

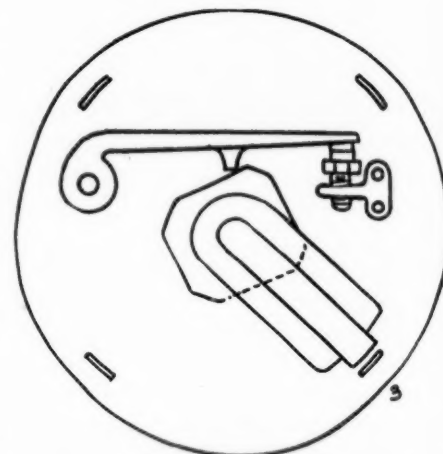


Fig. 3

Counter clockwise igniter must have distributor brush in line with a segment as points open

primary with a few turns will build up faster than one with a large number of turns.

"In Fig. 4 we have curves representing the way this current will build up in two coils that are supposed to have the same results as far as producing a spark is concerned. At the left we show a curve which represents the way the current builds up in an open circuit coil where the primary has 150 turns, and if left connected to a six-volt battery it draws 20 amperes.

"The closed circuit coil with which we wish to compare it has its curve shown at the right, and this indicates that the current only builds up to 5 amperes. We will also assume that this coil has twice as many turns as the other, or 300.

"The trigger type interrupter used with the open circuit coil, however, works with such lightning-like rapidity that before the current has had time to build up to the full value of 20 amperes, the points have snapped open, so that the current drops off again, and does not continue up along the dotted line but falls away to the zero line.

"This means that the magnetizing effect of the current, at the time the points opened, was measured by the number of turns, which was 150, and the current, which was 10, or 1500 ampere turns.

"The closed circuit coil, on the other hand, is working with an interrupter which is slow enough to allow it to build up to its full current value of 5 amperes so that the magnetizing effect is measured by the number of turns, which is 300, and the current of 5 amperes, so that its magnetizing effect is also 1500 ampere turns. The two coils are therefore equivalent as far as the action of their primary windings is concerned.

Excitement Begins When You Use the Wrong Coil

"The fun begins, however, if you try to use one in place of the other. If you take a closed circuit coil and connect it up with a trigger type interrupter, it gives but a faint spark, for the points make and break so rapidly that the circuit is opened before the current has had time to get a fair start toward its value of 5 amperes.

"On the other hand, if you get an open

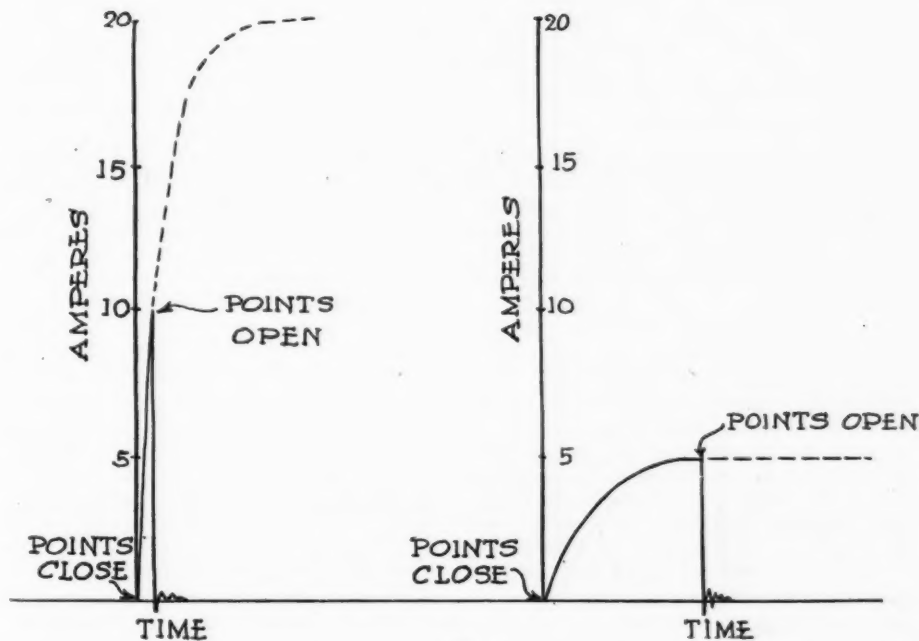


Fig. 4
Curve showing action of open circuit coil with 150 primary turns

Fig. 4
Curve showing action of closed circuit coil with 300 primary turns

circuit coil on a car that uses a closed circuit type interrupter, the coil will take so much current that it will burn itself up and melt the compound out.

"Even when you get the right kind of a coil for the car, you can easily get it connected wrong, for some of them have terminals marked with numbers which may not mean anything when you have no blueprint to go by, while others have no marks at all. Some have the terminals marked SW or INT and that helps quite a bit, but a real electrician should be able to test a coil and know from his tests exactly what is inside, and then be able to connect it right on the car, so that he does not have to do a lot of guessing, with the customer looking on and thinking things that would not look well in print.

"In Fig. 5 is shown a good test circuit for locating the primary winding in a coil, where an ammeter is used in connection with a six-volt battery. The only precaution in using this test is to see that the test points do not touch each other for any length of time or the ammeter will burn out. They may, how-

ever, be quickly flashed together just to see if the test is working.

Locating Connections to Use on Coil with Ballast

"Some coils have a ballast or small resistance on them, which is used to protect the coil, in case the switch is left turned on by mistake, and all of the primary current is made to flow through this resistance. On coils of this character, there sometimes seem to be three terminals, any two of which might be the ones to use.

"This test, however, makes it easy to get the right ones, for the test points are tried at different places, and the right terminals are the ones where the current reading on the ammeter is the lowest. With the lowest reading it means we have the greatest resistance, which shows we have the circuit where the ballast is in series with the primary winding. We can then forget the third terminal, for it is not a terminal at all but merely the place where the ballast was connected to the primary.

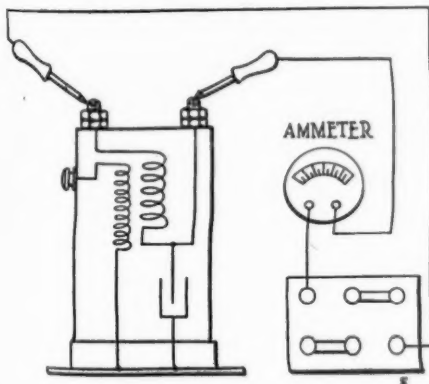


Fig. 5

A battery and ammeter make a good test for the primary winding

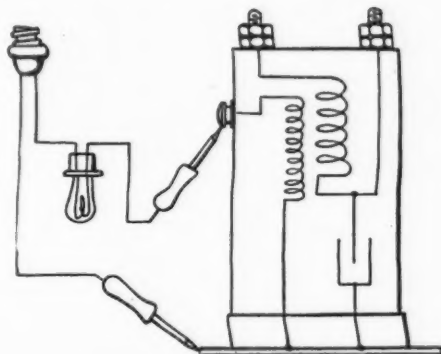


Fig. 6

Locating secondary with 110-volt test line

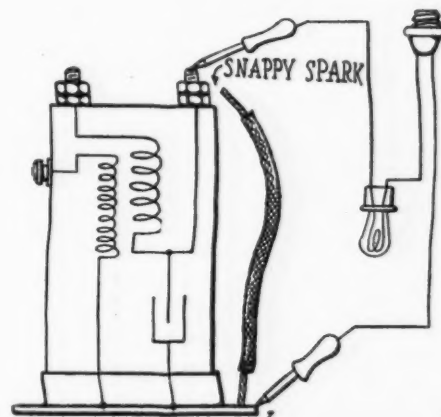


Fig. 7

Locating the condenser with 110 volt test line and a shorting wire

"With this test we also check, at the same time, the kind of coil, whether it is an open circuit or closed circuit type.

A Test to Locate the Secondary Winding

"The next thing to do is to locate the secondary winding with a 110-volt test line. This is something that the average man never thinks about. The live or hot end of the secondary can always be located, for the terminal is made different from the others to take the rubber-covered wire from the center of the distributor cap. The other end, or ground end, however, is not given much consideration, although it may be connected to the base plate or to the primary.

"If found to be connected to the primary, it means that the coil is designed to be used with a grounded battery and the returning secondary current will get back through the battery connection to the primary. On the other hand, if the base plate is used for the other secondary connection, the coil may be used on any sort of system, but the base plate should be grounded. Such a coil should not be mounted on a wood dash, unless a wire from the base is connected to the engine.

"If it goes on a wood dash and no such wire is used, the secondary current will find its way back by puncturing the coil insulation to complete a connection with the primary winding, and this may cause trouble sooner or later.

"In Fig. 6 the secondary winding apparently completes a circuit for the lamp but the resistance is so high that it usually does not light and the sign that indicates the secondary is a faint spark noticed when the circuit is broken.

"In testing for the condenser the 110-volt points are used in a little different way, for it will be remembered that the condenser has the ability to store up electricity and give it out again. Therefore, when the points touch the terminals which are connected to the condenser, the condenser receives a charge and, if at the same time another wire is used to short the condenser, a snappy spark will be obtained, the sound being somewhat like the crack of a small whip. Fig. 7 shows the way this test is made, and where the snappy spark will occur.

Where Head Work Speeds Up Hand Work

"The wise man in the electrical work is the one who uses paper and pencil

and headwork before he uses pliers and wrench and hand work, for the former often saves a lot of the latter. In the case of a coil test, it is easy to make a rough sketch of the circuits as each test is made, and when you have finished you have an inside diagram of the coil circuits.

"Then you will practically always find that there is one terminal which is connected to the primary winding and also to the condenser. You will never go wrong if you connect this terminal to the interrupter and connect the other end of the primary circuit to the ignition switch, so that it will be connected to the battery when the switch is on.

"Then ground the other condenser terminal, if the interrupter is of the grounded type, or, at any rate, see that the condenser is connected across the contacts.

"If you get the primary circuit reversed, it will be impossible to connect the condenser right; you will have it connected across the battery or across the primary, instead of across the points where it belongs.

"Then check to see that you have a return circuit for the secondary, and the job is finished."

23 Years Ago This Week In Motor Age

(From MOTOR AGE of Sept. 6, 1900.)

Hendee Turns to Motorcycles

The Hendee Mfg. Co., of Springfield, Mass., is preparing, according to newspaper reports, to engage in the manufacture of motorcycles. The Hendee company has been engaged in the bicycle business for a number of years past, and has a small but well-equipped factory with about 14,000 square feet of floor space.

Incorporates a Stearns Company

The Stearns Automobile Co. of Philadelphia has been incorporated with an authorized capital stock of \$1,000,000. This concern is the outgrowth, evidently, of the Anglo-American Rapid Vehicle Co., in which there has been internal dissension recently, resulting in the enforced withdrawal of Pennington, Lawson and others, and the election of E. C. Stearns of Syracuse to the post of manager.

A Notable Motor Tournament

The Chicago Inter Ocean has already fairly covered the billboards and blank walls of the Windy City with a profusion of posters, large and small, advertising its tournament of Sept. 18 to 22, while the country papers of the middle states are filled with reading notices concerning the exhibit and contests.

Paris Exposition Awards

PARIS, Aug. 25.—The report of the judges in the transportation class, including carriages, bicycles and automobiles, has been made public. The Columbia & Electric Vehicle Co. secured the highest award to any American motor vehicle, although gold medals were secured by the Locomobile Co. of America, the Riker Electric Vehicle Co., and the American Electric Vehicle Co., and silver medals by Columbia & Electric Vehicle Co., and Riker Electric Vehicle Co.

at the rear with an auxiliary seat that folds under the cowl. The rear deck contains a large luggage compartment enclosed by a flush door with an additional compartment at the back of the driver's seat.

The upper structure of the business coupe is built on a hardwood frame and covered with a material of leather texture. Forged carriage bows at each side create a distinctive appearance. The interior is upholstered in black leather with an upper covering of blue automobile cloth. A package compartment back of the full width seat supplements the larger compartment under the rear deck.

All models are equipped with cowl ventilator, gasoline gage, windshield

wiper, no-glare headlamps and the usual tire pump, tool equipment and jack.

Although many refinements have been made and four-wheel brakes added, prices on the complete line are lower than on the preceding model. In addition to bringing out the new model, Oakland has installed practically an entirely new production equipment of the most modern standard. The body plant is now located adjacent to the plant.

The Meanest Man in the World

THERE was a man once who made an imitation mail box and he used to take it out every morning and set it up on the street corner and at night he would take it in and take out all the letters people had put in it and tear off the stamps and throw the letters away.

And there was another man who held up a baby one dark night and took a stick of candy away from it and he licked the candy and found it wasn't peppermint as he had supposed but wintergreen which he didn't like and it made him mad and he threw away the candy and then he went back and hit the baby with a club.

There were both pretty mean men.

But they weren't any meaner and I don't think they were as mean as the man who when he was asked last fall to give a dollar and join the Red Cross so that the children in Europe and the disabled soldiers could be taken care of said, "No, he guessed he'd rather not." If you're setting up to be the meanest man in the world all you have to do to get a good start is to refuse to join the Red Cross when it asks you some time between the 11th and 29th of November.

Otherwise you'd better join.

(Continued from page 17)

a business coupe seating three passengers. The sedan is upholstered in silk velour of a toupe shade with a special stripe. The right front door is fitted with a tumbler lock while the other three have interior locks. The side windows are controlled by crank-type regulators. In the standard equipment of this model are also included floor heater, silk window shades, rear view mirror, dome light, aluminum scuff plates, corrugated steering wheel and foot and robe rails.

The general finish and features of the four-passenger coupe are similar to those of the sedan. This body has the offset driver's seat and a two-passenger seat

Community Service Stations

The Tire Shop, the Battery Station, the Mechanical Shop, the Greasing Rack, the Automobile Laundry and the Gas Station Combined to Help Each Other

By A. H. PACKER

I was a rotten looking tube, but Leatherman, the tire man, gladly complied with the customer's request to give it a test in the water tank. As Leatherman was giving it the air, there was a clatter and roar and a sound of gongs in the street as the fire engines dashed by. He glanced through the window while the air continued its deceitful endeavour. There was a popping noise, a tearing of old rubber, and the ancient tube gave up the ghost.

Many another man in like circumstances would have used the age of the tube as a sufficient alibi, but not so with Leatherman. From his ample stock, he took a new one and without a word handed it to his customer—his customer now, without doubt, for some time to come.

Fifty section jobs ahead and waiting to be done is a record of business that many a shop owner would envy, for with a reputation for square dealing the chief problem is in getting men for the work and getting the work through. Surely there is a definite connection between the jobs that pile up and the action of a man who gives a new tube without argument, when his own carelessness was partially to blame for a condition that might have been ascribed to a defect.

Not only in his repair work but in the sale of new tires Leatherman shows that he is not only a tire man but a business man as well. Seiberling tires are handled in his shop, and he sells them on a basis of quality, not on price.

One of his efforts at selling on the basis of serviceability of his product is shown in the way he decorates his show

window. While he varies it from time to time, the illustrations point to a sense of simplicity and novelty in the way he makes his goods talk to passers by. The



The chain hoist is ready for action

old tire in question shown at the right was run about as indicated and its life was spent in the service of Chicago Yellow Cab No. 69.

In the district where this tire shop

does a record business, a corn field existed some three years ago. Thomas J. Conn is the fortunate or clever owner of much of the property in this district, and not long ago decided to put up a gas station. After establishing this he put up a few more buildings in a circular formation, and it was in one of these that the tire shop was located.

Behind the gas station there was erected a series of individual garages and at one side of that a repair shop, and it wasn't long before the men running these separate business establishments saw the possibility of co-operation, and the establishment of a community service that would relieve car owners in that vicinity from taking their cars downtown when any work was needed.

The gas station, of course, does the most business, as far as numbers of customers are concerned, and is accordingly the best drawing card, although each business helps the other. A car owner may be in the repair shop having his brakes adjusted, and in working on the brake rods, the mechanic may notice that there is a great deal of corrosion on the battery terminals, or that a cable is rubbed so as to be dangerous.

One corner of the tire shop is rented to a battery man, and when such a case as above illustrated is encountered, the condition will be pointed out to the car owner, with the suggestion that the battery man in the tire shop can take care of it, and prevent serious consequences.

The tire shop has a chance to send work to the repair shop in many cases. For example, in installing a new casing, it might be observed that the brakes were



Every tire its own salesman. They speak for themselves



The garages are being combined with a new central building to form an automobile laundry back of greasing rack



The shop is equipped for a job of brake lining or carbon burning

dry, or the lining badly worn down, and a relining job might be the result for the repair shop.

The Greasing Rack Makes Things Run Smoothly

After the repair shop was going, a greasing rack was built on the other side of the gas station, between it and the tire shop, and this also is proving a good drawing card. Here the man at the oil gun has an unusual opportunity to observe the under part of the chassis and may in many cases be able to point out mechanical details that require the attention of the repair shop. Concrete pits are used at the greasing rack, with wood tracks to raise the car about a foot above the level of the surrounding surface, and as the cars back off down the incline it is a good chance to see how the brakes are working.

In the repair shop, small parts and supplies are carried for the average small job, and when special parts are required, the friendly services of the local Hupmobile dealer are available. The Shonig Motor Corp., while them-

selves doing repair work, extend the use of their pickup car to Frank Mills, who runs the repair shop, and as Mills is in touch with a large number of customers, many of whom may sooner or later be in the market for another car, he has a chance to return the courtesy.

Mills is building up his shop a little at a time, as profits from his work permit, and is getting one piece of equipment after another.

In one of the illustrations we see a Ford car, the patron of every small shop, with its position inviting the chain hoist to get into action. With his hoist Mills can swing the engines out where they can be worked on easily and just as soon as he can make the grade he intends to put in an engine stand.

His work bench, shown in another illustration, is well stocked with hand tools, while at one end he has a Black and Decker half-inch drill with stand, so that he is equipped for practically any drilling job, either on the bench or under the car.

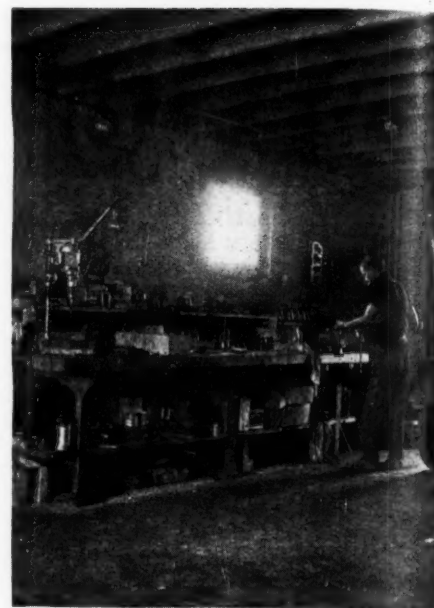
In another view there is shown his Multibestos cabinet of brake lining, while the tank of oxygen at the left means he is ready for a carbon burning job, where engines without detachable heads are troubled with musical pistons.

Individual Garages Abandoned in Favor of the Automobile Laundry

After trying out the individual garage idea for a while, Conn saw that it did not fit in well with the community service plan which was being gradually developed in the little group of buildings he had put up. A washing plant was needed to round out the whole scheme, so work was started on this project. In one of the illustrations where the greas-



Bird's-eye view of the Community Service Shops with Tire Shop in Foreground



The workbench is provided with hand tools and an electric drill

ing rack is shown at the right, the work on the auto laundry can be seen. The doors of the garages will be taken off and a brick addition between will weld the whole into one suitable building.

The community idea is yet in its infancy but it points out the possibility of co-operation, rather than competition, between automotive shops in a community, or between departments in the same establishment.

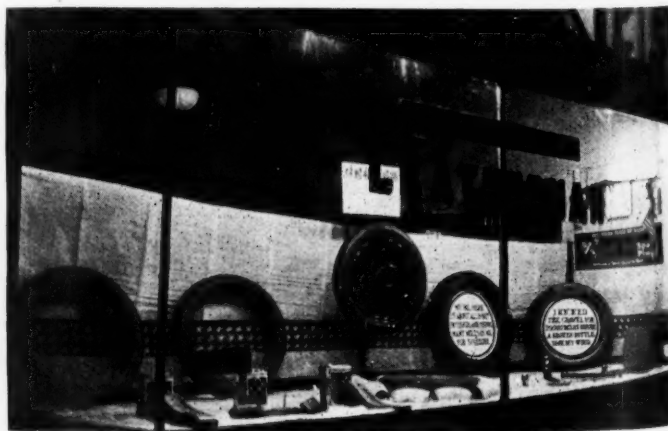
Community Advertising Will Reduce the Cost of Each Shop

In small automotive establishments it is often realized that a certain amount of advertising should be done to keep before the people the fact that such a concern exists. The cost, however, may boost abnormally the overhead expense that the shop must carry.

With an association of shops, however, it would be possible not only to advertise in a novel way, that practically any need of the car owner could be met in one shop or the other, but the cost of a good advertisement could be divided among the various shops, so that it would not be a burden on any one of them.



The repair shop is at the left of the gas station



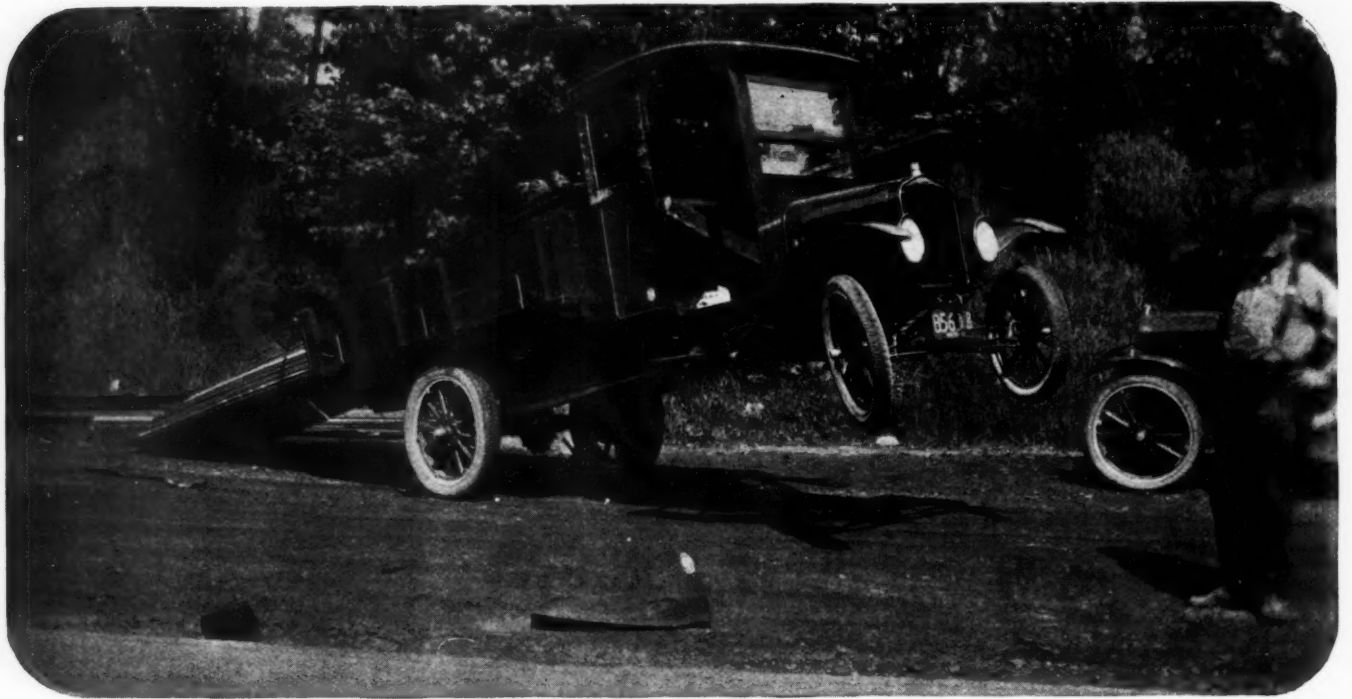
The tire window at night presents an attractive appearance

Sparkville Greasehounds Association Annual Labor Day Picnic

By CARL A. MOST



MOTOR AGE'S PICTURE PAGES

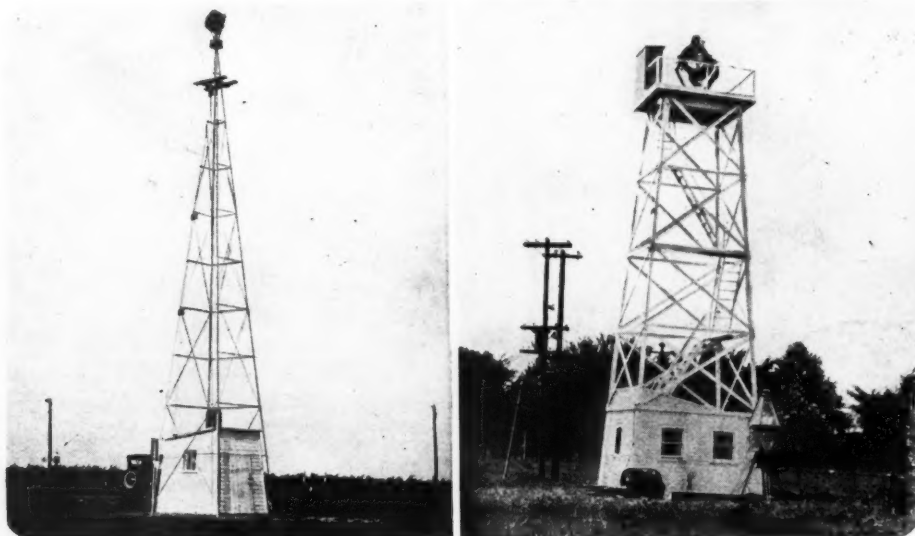


A protest, it would seem. Well, why not? And not because of bootleg gasoline, either. A trailer would have made things much easier here—would have lifted the load from the rear axle and made possible the carrying of the load without the Ford kicking like a chorus girl about it



Eugene V. R. Thayer, chairman of the board of directors of the Stutz Motor Car Co., with W. N. Thompson, president, Tom Rooney, veteran race driver, Luis Angel Firpo, destined to meet Mr. Dempsey soon and to become a Stutz distributor in South America, Alfred Mayer, Hugh P. Gartland and G. Widmer

Below: Uncle Sam's first transcontinental air mail service was inaugurated at Mineola, L. I., recently and these beacon lights mark the highway of the air which goes cross country from New York to San Francisco



G. H. Hannum, President of the Oakland Motor Co.

OF AUTOMOTIVE INTEREST



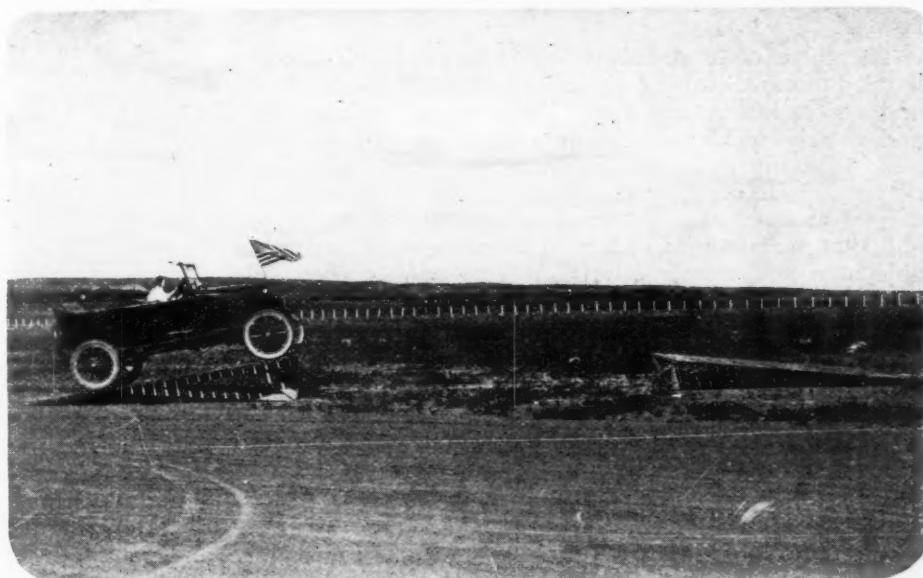
The stage coach hooks up with its grandchild for a jaunt across the prairies from Rapid City, South Dakota, to Philadelphia in a stunt for the Custer Highway. Perhaps the old stage coach's last trip



George Tranberger is not being asked to support Norma Talmadge as Romeo in the film star's greatest picture but he "knows his stuff"—and does it just the same. In the gasoline chariot pictured here, he drove many miles to court his Juliet but the cops sent him back home because George is only fifteen.



Speed Wallace lives up to his name in the Star car at the Northwest Fair at Minot, North Dakota, by making a jump of 33 feet from one trestle to the other. The circle shows the car completing the feat with ease



MOTOR AGE

Reg. U. S. Pat. Off.
PUBLISHED EVERY THURSDAY
Copyright 1923 by The Class Journal Co.

Vol. XLIV

Thursday, September 6, 1923

No. 10

THE CLASS JOURNAL COMPANY

Horace M. Swetland, President
W. I. Ralph, Vice-President E. M. Corey, Treasurer
A. B. Swetland, General Manager
David Beecroft, Directing Editor

Mallers Building, 59 East Madison Street, Chicago

BUSINESS DEPARTMENT
E. E. Haight, Manager

EDITORIAL
Clyde Jennings, Editor
B. M. Ikert, Technical Editor

DETROIT OFFICE
J. Edward Schipper

WASHINGTON OFFICE
26 Jackson Place, N. W.

BRANCH OFFICES

New York City—U. P. C. Bldg., 239 West 39th St., Phone Pennsylvania 0080
Detroit—317 Fort Street, West, Phone Main 1351
Cleveland—536-540 Guardian Bldg., Phone Main 6432
Philadelphia—1420-1422 Widener Bldg., Phone Locust 5189
Indianapolis—1212 Merchants Bank Bldg. Ph. Circle 8426

Cable Address.....Motage, Chicago
Long Distance Telephone.....Randolph 6960

SUBSCRIPTION RATES

United States, Mexico and U. S. Possessions.....	\$3.00 per year
Canada.....	5.00 per year
All Other Countries in Postal Union.....	6.00 per year
Single Copies.....	35 cents

Subscriptions accepted only from the Automotive Trade

Owned by United Publishers Corporation, Address 239 West 39th St., New York; H. M. Swetland, President; Charles G. Phillips, Vice-President; A. C. Pearson, Treasurer; Fritz J. Frank, Secretary.

Entered as second-class matter Sept. 19, 1899, at the post-office at Chicago, Ill., under the Act of March 3, 1879.

Member of Associated Business Papers, Inc.
Member of the Audit Bureau of Circulations.

The Pedestrian

THAT part of the automotive trade which is wise will not fight the pedestrian. To do so will only result in greater popular feeling against the automobile and cause the enactment of more irksome regulations.

The automobile already stands approved by the public as a practical utility, universally desired for business and recreational purposes. The careless, thoughtless and utterly reckless—even impudent—use of automobiles in many cities, by persons who ought to know better, is hastening the day when the state will demand mental and physical examinations of all drivers. Too bad that so many keen, intelligent and highly respectable men and women lose their heads when they get behind the wheel of a powerful car.

Watch them in the loop in Chicago. See them lunge forward under full power the moment the traffic officer gives them the right of way. Hear their horns screech as men, women and children scamper like rabbits to avoid being run down. What business have pedestrians in the middle of the street! Only trying to cross after waiting at the curb several minutes and half way to the other side when the whistle blows.

But they should step lively, the motorist says, and certain trade associations preach. Yes, you and I can

step lively, and thus our lives are saved, but see the old women and the aged men, from whom the spring of youth is gone forever, trying painfully to step lively as powerful cars bear down upon them.

A Chicago newspaper this week printed a photograph of the wreckage of two baby carriages demolished in one day at boulevard crossings. What if the mothers were careless. That is no excuse for recklessness on the part of the motorist whose obligation is to drive at all times so carefully that he may avoid injury to children, the aged, the lame, the feeble and the weak minded.



Learn to regard selling used cars not as a necessary evil but as a profitable business undertaking.



Statistics and Facts

IT has been a part of the program for the writer to hear a number of learned men discuss seriously the sales prospects of communities during the past few months. Always these discussions were based on population, separated into groups such as heads of families wage earners, men voters, negroes and others with which you are all familiar. The groups are always slightly different but they mean the same thing and there are always some constants. Always the negro is eliminated as a car buyer.

Now when it comes to travel, appearances are either very deceiving or the figures are wrong. You can take your choice.

Once the tourist drops below the Mason and Dixon line or invades the east he begins to wonder. On a seat above the main tourist highway leading into Washington one observes ten large cars drive into that city in an hour carrying negro tourists. These touring outfits are very much like those of the white tourists, with luggage carriers holding suit cases and sometimes tents. The passengers usually look like family parties. The license plates come from many states. The chief difference appears to be in the size of the cars. The negro tourist and the small car appear to be strangers.

What is the answer if the negro is not a car buyer? Also how comes it that throughout the tourist country and in and near the big cities one sees so many negroes driving good cars, and some of them of the new and shiny sort? Is it possible that the banker, statistician and the car sales authority, most of whom sit at desks in northern cities, have not the proper conception of humanity because it is of a darker skin?



Superior workmanship means little to the car owner if his car is left dirty when delivered to him.



The Air Mail

LETTERS mailed in New York in the morning are being delivered in San Francisco the next afternoon. New York morning newspapers make the same time when entrusted to Uncle Sam's air mail pilots. This is slow communication when compared with the telegraph, telephone and radio. But think of the cheapness of it and consider that it constitutes actual physical transfer, with all the advantages thereof, of letters, signatures, contracts, checks, printed matter and commodities.

For 24 cents the air mail will deliver in San Fran-

cisco a letter posted in New York the day before. Sixteen cents is the price from Chicago. Time will come when the familiar red portrait of George Washington will do the job.

Automotive progress of highest importance is recorded by this latest achievement of the air mail. Aerial transportation of the mails is not new. For months skilled flyers have winged their way from New York to Chicago and from Chicago to Cheyenne. But never before have they flown in continuous relays from coast to coast, day and night. The night flying is between Chicago and Cheyenne. The trail is blazed with searchlights, small ones every three miles, huge ones with emergency landing fields every 30 miles. Landings are made at regular points where fresh pilots and fresh ships stand ready, just as in the old stage coach days, to take up the cargo and speed on without delay.

Engines which drive these airplanes are of the automotive type. They have cylinders and pistons and carbureters and valves and crankshafts and the overhaul artist in any well equipped shop would delight in the opportunity to tear one down. They are being constantly improved, the objective being greatest horsepower per pound of weight.

We are learning to fly with our automotive engines. Thousands of machines will wing their way through space and the automotive industry will progress.



The owner's opinion of the car you sell him will depend largely on the kind of service he gets.



Encouraging Service

IT is interesting when a group of fifteen manufacturers of shop equipment meet with their sales staffs for three days to discuss how to aid the shop equipment business. It is still more interesting when, at the adjournment of such a meeting the conclusion is given out that the way to boost shop equipment sales, is to boost honest and profitable maintenance methods.

The sale of shop equipment will be boosted just as soon as the shop owners of the country master the economics of paying for it in their daily receipts. Overhead is always increased by the addition of equipment and while thousands of maintenance dealers throughout the country are aware of this fact and are paying for the equipment as they go along, there are thousands of others who do not understand how to cover overhead and these men must be educated on this point.

If the shop equipment manufacturers' salesmen of this country will impart some of the fundamentals of the economics of their equipment to the jobbers and the jobbers' salesmen, so that the latter, when he sells an engine stand to a dealer, will show that dealer that the stand is not merely a convenience, but that it is an actual aid in the speed with which work may be accomplished and that the dealer and the mechanic should share in this profit, instead of passing it all along to the owner of the engine, then will the sale of engine stands be on a better and a sounder basis.

Too much money has been spent by shop owners for engine stands to pass on the benefits of these as a charity to the car-owning public. Each piece of this equipment benefits the car owner in time on the job or accuracy of work and the car owner should pay for the

use of the equipment. The method is, of course, to split the saving with the car owner, thus giving him a less cost per job and the shop a higher rate per hour.



Don't merely sell cars, sell units of transportation.



Wonder What a Clearing House Editor Thinks About

H O HUM, here's another letter from a fellow trying to do business without letterheads. They'll be writing in on the paper from last night's hamburger next. Wants a diagram—sure—didn't see the one in last week's issue. Oh, well, I'll tell him where to find it. Last week's issue has probably slid down into the oil and junk behind his bench by this time. Spouse I better send him another to make sure he doesn't get stuck.

Here's one where that same stuff, Magic Electrotape for decrepit batteries, crops up again, wants our advise as to putting some money into the project in this country. Sure he can put money, in, hard part is getting it out.

And the race bugs we have always with us—can't seem to get the idea, that the engineer's didn't put those axle gears in that way just for meanness, to make the car slow. Expect to get 90 miles an hour from different axle. Well here goes with the same stuff about balancing the parts, reaming the ports, and all the rest of it.

Here's another fellow wants a diagram. These birds should put a little money into service manuals. Its all right to send in for information, but their customers must be more patient than some I've seen, to wait three or four days to have the job done. Wants to use a lot of old electrical stuff on his victim's car. Better make up a sketch to fix him up. None of the regular diagrams fit the case, after all.

This one's on a classy letter head but he wants some information they didn't have in the books when that old bus was hatched. Guess I'll stroll up the row after lunch and talk too some of the old timers about that job. Some of them will have a few ideas I can pass along to keep this fellow out of trouble.

Did I say lunch time. Gee, it's 12:30 now. Come on fellows, let's eat.



Make friends and your friends will make you.



New Models

A GAIN we have with us New Models. Some are and some are not. But they bear the label of 1924 and so they must be better than anything made under the banner of 1923. Some will be and some won't.

A bit of adventurous daring is being exhibited by one of the largest manufacturers. Engineering principles never before widely adopted in America are accepted and included in the construction being passed on to thousands of new owners. The product for years has been standard. The public expects it to continue to be so. If the engineering should be found to be defective it undoubtedly will be corrected by an institution with a national and international reputation to maintain.

The result of this pioneer step is models which are really new. Such steps are necessary for progress. Highly satisfactory as were the 1923 models, and the new ones not much changed from them, still no one can say that the ultimate in motor car design has been reached, and therefore all who are interested in progress should welcome departures from the old in the direction of the untried.

New Models Hold Interest of Everyone

Dealers Using County Fairs to Arouse Farmer Interest

Parts and Tire Industries Enjoy Fair Run of Business for Season of Year

NEW YORK, Sept. 4—New models continue to occupy the greatest attention, both from the manufacturing and selling end of the automotive industry. A quickening of interest is reported on the part of prospective buyers, leading to increased sales and forming somewhat of a basis on which manufacturers are plotting their schedules for the remaining months of the year.

With the arrival of new models, automobile shows, the forerunner of the season that is ushered in with the holding of the New York Show, are being staged in some communities and are producing results. This is particularly true of the exhibits held in connection with state and county fairs, where farmer interest in automobiles is reported as being keen. These rural shows are productive of sales and bring out good prospects.

Dealers are showing an increasing disposition toward utilizing the country fair as a means of arousing farmer interest in automotive products to a high point and this fall doubtless will see a greater number of motor vehicle exhibits in conjunction with such fairs than in past years. Producers early in the year anticipated that the farmer would offer the best prospect in the period when sales were on the decline in commercial centers, and they are now extending their full facilities to realize on this anticipation.

Conservatism on the part of motor vehicle producers is shown by the report that commitments for parts are not extending, for the most part, much beyond October. This is not indicative of any fear of a slump in purchasing during the rest of the year, but shows rather that manufacturers prefer to move cautiously until exact conditions are apparent.

While many car producers experienced a lull in operations during August, there were some among the major manufacturers who maintained consistently high schedules. These report business to be sufficiently active to keep programs at the same level during September and running farther into the fall. It is not to be expected that in the remaining months the industry as a whole will reach any of the output marks reported for the high production months of the first part of the year.

Despite a falling off in sales by parts makers during July, conditions in this branch of the industry are good. Some improvement was noted in August and present reports tend to show that there will be a further forward movement in September. While sales declined in July, the total volume was in excess of

that for the same month of the preceding year. Collections are good.

Tire manufacturers are not announcing increased production schedules pending the more active movement of finished goods inventories and reports from dealers of low stocks. It is evident that this branch of the industry is making efforts to keep production close to actual needs and to prevent, in the future, the accumulation of heavy inventories in dealers' hands. One of the major companies is discountenancing stocks that cannot be moved easily within two weeks. The movement of tires from factory warehouses is reported to be showing some betterment.

General Motors Traffic Managers Form Association

DETROIT, Sept. 1—Organization of traffic managers and directors of traffic of General Motors divisions, subsidiaries and affiliated companies was completed here at a meeting presided over by A. H. Swayne, vice-president of General Motors Corp.

The object of the new group is to coordinate the various traffic problems which confront the many divisions of General Motors and to develop the policies of General Motors towards railroad questions in general. The committee will hold bi-monthly meetings, at which there will be general discussions of traffic problems and the utilization of the individual experiences of the members of the association in working out solutions of these problems.

Swayne will serve as chairman, with C. A. Sullivan of Fisher Body as secretary. A sub-committee consisting of George C. Conn, chairman; C. A. Sullivan, W. C. LeFebvre, C. R. Scharff and Earle W. Webb will act as a clearing house for the whole committee.

MUCH BUILDING IN MIAMI

MIAMI, Fla., Sept. 1.—Miami claims the distinction of leading the entire south in the construction of new buildings this year by automobile distributors and agents, and by independent garage companies, a \$150,000 building now being constructed by the Franklin-Craig Automobile Co., at 42 N. E. Second street, being the twenty-fifth building of this kind constructed in the city since Jan. 1, 1923. It is estimated that 25 buildings in all represent an investment of nearly \$1,000,000.

GOODRICH ACQUIRES BRUNSWICK

AKRON, O., Sept. 1.—The business of the Brunswick Tire Corporation which was recently organized as a subsidiary of the Brunswick-Balke-Collender Co., for the purpose of carrying on the parent company's tire manufacturing activities, has been acquired by the B. F. Goodrich Co., of Akron. It is understood the Brunswick Tire Corp., eventually will become a Goodrich subsidiary.

A. E. A. Announces Window Trimming Contest for Dealers

\$500 in Prizes to Be Awarded Best Settings for Selling Cars and Accessories

CHICAGO, Sept. 1—A window trimming contest for automotive accessory dealers in which cash prizes of \$500 will be awarded has been announced by the Merchandising Department of the Automotive Equipment Association, by Arthur R. Mogge, director.

The contest will be open to all accessory dealers, car dealers, garagemen, service stations and others engaged in the resale of automotive equipment and service anywhere in the United States or Canada. First prize will be \$150, second \$100, third \$75, fourth \$50, fifth \$25, and the next 10 prizes will be \$10 each.

Every window must have displayed in a prominent place at least one large card or streamer bearing the A. E. A.'s Christmas slogan, "Something for the car for Christmas." The winners will be determined from photographs submitted by the contestants. The contest closes Dec. 15. The judges will be five editors of automotive business papers.

California High Schools Will Teach Automobile Mechanics

SACRAMENTO, Sept. 1—Automobile mechanics will be taught as a regular part of the curriculum in a number of California high schools this year. The first class has been organized at the Redding high school, and the state educational authorities have been asked to authorize the establishment of similar classes in other high schools up and down the state from San Diego to Redding.

These classes will give instruction, first in the correct operation of automotive vehicles, and, second, in the maintenance and repair of them. Practically every boy student in the Redding high schools, which have several hundred pupils, has enrolled in the class. Hitherto, automotive mechanics have been taught only in the universities and the private schools of the state.

With the rapidly increasing use of automobiles in California, suggestion has been made that a class in operation of automobiles be established in the highest grade—the eighth—of the grammar schools. This, it is believed, would result in the production of a better class of more competent drivers.

INVESTIGATING GAS PRICE

SALT LAKE CITY, Utah, Sept. 1.—Gov. Mabey is conducting an investigation into the price of gasoline. There was a drop of two cents the other day. Gasoline is retailing here at 24 cents.

Factories Look for Better Conditions in September

Interruption, Caused by Introduction of New Models, to Be Smoothed Out

DETROIT, Sept. 1.—After a somewhat reduced production in the industry during August, due primarily to the upsetting influence of new models on factory schedules, September output should show marked improvement. Factories which have been down while new equipment was being installed are again under way and are gradually working up production to points which will compare favorably with early year schedules.

The new months will open up with only two important producing companies practically down, both of these for the installation of equipment preliminary to the appearance of new models. Those companies which have brought out new cars in the past month are rapidly working up their daily totals and declare ample business in sight for the next 60 days to warrant capacity operation. Several companies which have not introduced new models have made price reductions which are expected to have an equivalent effect on sales.

Ford's anticipated 180,000 production in August was not realized owing to the presentation of the re-designed car, but a total similarly high has been set for September. Daily output during the month is expected to adhere closely to the 7,000 figure. Chevrolet's schedule continues at the approximate 2,000 daily figure and Gray and Star will maintain operations at about the 300 and 150 daily figures respectively, that they have operated on during the past several months.

Buick production in September will run in excess of 650 daily with gradual increases to the 800 mark. Studebaker and Dodge are speeding up and should approximate the 600 and 1,000 daily marks respectively before the month ends. The Essex plant is undergoing changes which will cut Hudson-Essex totals in the month. Hupp is aiming at the 200 daily mark and Paige-Jewett will continue at about this figure during the month.

Oakland is in production on its new models and will be ready for capacity operation of 300 daily during September. Oldsmobile is in nominal operation and will not get under way until late in the month. Reo is at capacity and is approximating 150 daily, cars and Speed wagons. Rickenbacker production is approximating 50 daily. Maxwell-Chalmers at the new prices, looks for increased operation during September.

Columbia is operating at about 50 daily and Dort is running along at about this same figure. Durant is building about 100 four's daily at the Lansing plant. Earl operation is expected to reach 25 daily during September.

In the higher priced lines, Packard is at capacity and is approximating 100 daily. Cadillac after making a number

of plant changes is increasing output and will reach capacity during the month. Wills Ste. Claire will increase production during the month and is gradually extending its retail organization. A new Detroit retail branch will be opened during the month.

Truck output is expected to improve during the month after a rather severe slowing down during the summer months. Several of the big producers have been on part time and others which operated on close to normal schedules have accumulated somewhat of an inventory in completed vehicles.

September Promises To Be Best Month in Atlanta

ATLANTA, Ga., Sept. 1.—Automotive sales in Atlanta and the Southeast since the new models were announced and shown have experienced a remarkable increase, most of the distributors having not only sold their first quota of the new models, but having orders in hand for early delivery that will serve to make September the biggest month of the year, and probably one of the biggest months in the history of the industry in this district. There has been more interest shown on the part of the public in the new models this year than ever before, and the salesrooms along Automobile Row have been virtually crowded every day since the new models were announced. Several distributors have adopted the policy of remaining open during the evenings for a temporary period.

In point of sales volume August was one of the biggest months of the year to date in cars sold and delivered, and the outlook for the rest of the year is more promising than it has been in a decade. There are indications of a 12,000,000 bale cotton crop selling at an average price of 25 cents a pound, which will mean big business for the automotive industry over the entire south the coming fall and winter, and well into 1924.

PEERLESS ANNOUNCES CUT

CLEVELAND, Sept. 4.—The Peerless Motor Car Co. made another preparation for an intensive sales campaign in the immediate months and for 1924 when it announced a sweeping reduction in prices. The cut was made as a result of greatly increased production, coupled with a complete standardization of the product, and at the same time refinements have been added.

The announcement also was made that D. A. Burke, who has been in charge of the company's eight branches for the last several months, has again taken complete charge of branches and all other mediums of distribution.

The schedule of old and new prices is:

	Old	New
4 Pass. Tour Phaeton.....	\$2990	\$2690
7 Pass. Tour Phaeton	2990	2750
3 Pass. Road Coupe	3400	3300
4 Pass. Town Coupe	3600	3390
4 Pass. Suburban Coupe.....	3550	3390
5 Pass. Town Sedan	3900	3740
7 Pass. Suburban Sedan.....	4090	3840
Limousine	4390	4090

Essex Special Wins Annual Pike's Peak Hill Climb

Glen Schultz of Colorado Springs Drives His Mount Over Course in 18 Min., 47 2/5 Sec.

COLORADO SPRINGS, Colo., Sept. 3.—An Essex Special, driven by Glen Schultz, of this city, was awarded the Penrose trophy when it won the fifth annual Pike's Peak hill climb. The time for the 12 and two-fifths miles course was 18 min., 47 2/5 sec. This crowded the course record of 18 min. 24 7/10 sec., made in 1916 by Ralph Mulford in the Hudson.

Besides being awarded the \$1200 silver and gold trophy for one year, Schultz won \$500 in cash, going to the winning car in the 183 cubic inch piston displacement class. Second prize of \$200 in this class went to D. W. Day, driving a Chevrolet Special. His time was 26 min., 15 2/5 sec.

First and second place for cars up to 300 cubic inches displacement and weighing under 1800 lbs., went to Otto Loesche and Jack Knight, respectively, both driving Lexington Specials. Their time was 19 min. 29 4/5 sec. and 21 min., 48 2/5 sec.

The event for cars over 300 cubic inches displacement and up to 2000 lbs., went to Charles Myers in a Studebaker Special. His time was 19 min., 21 2/5 sec. J. C. Allen in a Paige, was second in this class, his time being 20 min., 22 3/5 sec.

Loesche won the trophy 3 years ago and one event a year ago. Schultz, today's winner, won several cash prizes during the last two climbs. Thus far no driver has won the Penrose trophy more than one of the three times required for permanent possession.

The climb, which is conducted under the sanction of the A. A. A. for non-stock cars, starts at an altitude of 9,150 ft. and ends 14,109 ft., with grades ranging from seven to 10 1/2 per cent. There are 60 curves in the course. Fourteen cars were entered.

Salt Lake Dealers Don't Expect Much Farm Business

SALT LAKE CITY, Utah, Sept. 1.—Automobile firms generally are not looking for a very large turnover this fall. They expect the city business will be satisfactory in volume but they are of opinion the price of wheat will keep the farmer from buying and that it will also have some effect on city sales.

Business men in other lines, however, do not think the price of wheat should figure to any appreciable extent in the purchasing power of the farmers of this section. Wheat is not the principal agricultural crop and prices for everything else, as well as transportation facilities, are all that could be desired. Manufacturing is from 20 to 50 per cent ahead of last year at this time. Mining is also much better.

Mount Says Condition of Farmers Is Much Improved

Head of Tractor Company Declares Most Reports of Agricultural Distress Are "Loose Talk"

CHICAGO, Sept. 1.—Farmers are much better able to buy tractors and other needed commodities than they were in 1921 or 1922, according to Finley P. Mount, president of the Advance-Rumely Co., who characterizes as "loose talk, bunk and political propaganda" much of that which has been said and printed about the poverty of the farmer. In a letter to the selling agents of his company he discusses the situation as follows.

"Of course some farmers are losing money. So are some people in every other business. Some farmers will always lose money, because they either do not know how or will not learn how to manage their business properly, and this is true of every other business. But good farmers are now enjoying a reasonable degree of prosperity.

"In 1921 the farmer was pretty hard hit. In 1922 by reason of better prices for some commodities and better yields of others, his crop brought him \$2,000,000,000 more than in 1921. Now in 1923 measured by present prices and estimate of yields he will have \$1,000,000,000 more money for his crop than he had in 1922, or \$3,000,000,000 more than he had in 1921.

"True, wheat recently dropped below a dollar in Chicago, but did it ever occur to you that wheat constitutes only seven per cent of the total value of farm products in the United States? The loss in the price of wheat is greatly outweighed by the increase in the price of corn. The low price of wheat may reduce the acreage put to wheat, but be assured that acreage must be farmed, it will go into something else. The point I want to stress is that the farmer today is better able to buy our machinery than he was last year, and we know from actual experience and results he was much better able to buy in 1922 than in 1921. We must not therefore allow this talk about agricultural depression, much of which is political bunk and propaganda, to slow us up in our sales effort for 1923.

"I want to tell you that in my judgment our business has suffered more this year from loose talk than from the farmer's actual condition. There are farmers aplenty who are able to buy and it is up to us to find these farmers and sell our goods."

Michigan Dealers to Talk Shop on Boat Trip Sept. 10

DETROIT, Sept. 1.—Michigan Automotive Trade Association will hold its semi-annual trade conference Sept. 10, on the steamer City of Toledo, which has been chartered for the day to take the tradesmen to Put-in-Bay, a resort on Lake Erie. The conference will be held dur-

ing part of the voyage, leaving the rest of the time to fun. The steamer leaves Detroit 9:30 a. m. and docks at 10:30 p. m.

Speakers at the conference will include Clyde Jennings, editor of Motor Age, who will speak on "Trade Outlook and the Part Service Plays in the Sales Scheme," and Wayne Hearn, sales engineer, who specializes in used car problems, his subject being, "Used Car Merchandising." Frank R. Lusk is chairman of the entertainment committee. The Studebaker Corp. has donated the services of its band. The visit of the dealers to the resort occurs co-incidentally with the 110th anniversary of Perry's victory.

Harding Highway to Be Name of New Boulevard

SAN FRANCISCO, Sept. 1.—The new boulevard southward from San Francisco along the peninsula probably will be named "Harding Highway," as a memorial to the President who passed away here a few weeks ago. The streets committee of the San Francisco County Board of Supervisors, which has charge of the construction of this wide scenic boulevard along the bay shore, has recommended unanimously to the board of supervisors that the President's name be given to the highway. This action undoubtedly will be taken.

ORGANIZES PEDESTRIANS

WASHINGTON, Sept. 1.—The newest "wrinkle" in associations has made its debut in Washington—the national headquarters of more associations, local, state, national and international, than any other place in the world.

It's the Association of Pedestrians, organized as the name might indicate, as a protective measure against automobilists. The guiding hand and organizer back of the association is Vincent C. McDevitt, temporary president of the organization. In discussing its inception, Mr. McDevitt, says:

"The Association is being formed for the express purpose of protecting the interests of the pedestrians as against those of the automobilists."

The association claims a membership of more than 500 already with a growth of approximately 25 a week. Members are charged \$2 annual dues.

OFFICERS BUY FACTORY

DETROIT, Sept. 1.—The Jackson Motor Shaft Co., a unit of Earl Motors Corp., has been purchased by its officers and will be operated under the new control after Sept. 1. The purchase price is not announced, but is understood to approximate \$500,000.

The new officers of the company are O. H. Schulz, president and general manager; C. H. Franklin, vice-president; Charles Hueman, secretary; and Frank Stienke, factory superintendent.

Intense Competition Ahead For Fall Season in Chicago

Large Number of Used Cars on Market at Low Prices Complicates Situation

CHICAGO, Sept. 1.—A season of intense competition in the selling of automobiles appears to be in prospect for dealers in Chicago and surrounding territory. The situation has developed in the last few weeks into what is probably more completely a buyers' market than has existed for many months.

The used car appears to be at the bottom of the matter. The results of a very active spring and summer of selling new cars, for most of which old cars were taken in part payment, are now being felt. There are available great numbers of used cars of well known makes at prices from 10 to 25 per cent lower than such cars would have brought a month or two ago.

There is still a good demand for new cars and the prospects are that the demand will be greater in the next two months. Most of the prospective purchasers, however, will have used cars to trade in and with used cars selling at bottom prices it is hard for the dealers to get them for allowances that will leave them a profit.

General business conditions in this territory remain sound. The harvesting season is at hand and crops are good. Although prices are not all that the farmers would like they are sufficient to bring in a lot of ready cash. Employment in the industrial centers continues to be general.

Interest here in new models of automobiles is keen and with some of largest manufacturers making radical changes there is a disposition on the part of the public to wait for the last word. Deliveries in most lines are now made promptly and there are some cases of new cars being advertised at reductions of 25 per cent from list price.

Maxwell-Chalmers Prices Are Reduced \$50 to \$100

DETROIT, Sept. 1.—Effective immediately, the prices on the Maxwell cars have been cut from \$90 to \$65 on the open models, and from \$40 to \$50 on the closed cars. On the Chalmers, all models have been reduced \$50 with the exception of the sedan which is \$100 lower.

The new list is as follows:

MAXWELL			
	Old Price	New Price	
3-pass. Roadster	\$ 885	\$ 795	
Sport Roadster	975	885	
5-pass. Phaeton	885	795	
Special Sport Phaeton	1,045	975	
Red Sport Phaeton	1,025	960	
Club Coupe	985	935	
Standard Coupe	1,235	1,185	
Standard Sedan	1,335	1,285	
Travellers Sedan	1,635	1,585	
CHALMERS			
5-pass. Phaeton	\$1,235	\$1,185	
Sport Phaeton	1,385	1,335	
7-pass. Phaeton	1,345	1,295	
4-pass. Coach	1,585	1,535	
7-pass. Sedan	2,195	2,095	
3-pass. Roadster		Discontinued	

International Transport Congress to Be Held in May

N. A. C. C. Announces It Will Call Meeting at Detroit to Consider Motor Problems

NEW YORK, Sept. 3—Sponsored by the National Automobile Chamber of Commerce, the first international motor transport congress will be held at Detroit in May, 1924. It will be a non-partisan effort to put the entire world on wheels, to convert everyone, to the belief that the automobile is a utility vehicle that cannot be dispensed with in these modern times, or, as the N. A. C. C. expresses it in the announcement just made, "to provide a better understanding of the economic factors underlying motor transportation in every part of the world."

While the definite date has not been settled, it is planned to make it a four-day convention, for which invitations will be extended to foreign government officials, automotive associations, dealers representing automotive manufacturers abroad, and editors of trade papers devoted to motor transport in each of 114 countries where motor vehicles are used.

Initial preparations for the congress are being made by Foreign Trade committee of the National Automobile Chamber of Commerce of which J. Walter Drake, now Assistant Secretary of the Department of Commerce of the United States, was formerly chairman. As yet no successor to him has been named, the committee's personnel at the present time consisting of H. M. Robins, Dodge; Jay P. Rathbun, White; H. B. Phipps, Hudson; J. D. Mooney, General Motors; Howard S. Welch, Studebaker, and G. F. Bauer, secretary.

This committee is engaged in preparation of the program for the congress, planning to card subjects of direct bearing on the economic development of international motor transport, to be handled by prominent executives in automobile companies who also are active on N. A. C. C. committees that study automotive problems pertaining to taxation, highways, insurance, distribution, servicing, operation, financing and other co-operative activities.

Actual automotive conditions in specific countries also will receive attention. Speakers to be chosen from among the delegates will be asked to review the automotive situation in their respective continents and to touch on problems with which they are confronted and in the solution of which the manufacturers and delegates from other countries also are interested.

"The industry believes that this practical exchange of experiences by official and automotive representatives from all countries will tend to create a better understanding of the part contributed by the motor vehicle to the economic development of nations and to help solve urgent transportation problems which are pressing in many countries of the

world," says Secretary George F. Bauer of the Foreign Trade committee.

It is expected that the congress will attract approximately 1000 delegates. General Motors has 500 in its export service, most of whom are eligible as delegates, while other big concerns like Studebaker and Willys-Overland can be counted to back the meeting to the limit.

Catching Speeders Is This Family's Specialty

WASHINGTON, Sept. 1—There are some things which give a motorist a laugh, even in times when he feels he has been unjustly dealt with when he falls into the grasp of the minions of the law.

A. Cloyd Gill, a District motorist, was picked up in a Maryland village, lying just across the District line. He was taken before the judge and charged with speeding two miles in excess of the limit.

The judge who fined him was the father-in-law of the officer who made the arrest. The unlucky motorist lacked \$2 of the required amount in cash, so he was permitted to leave his car with the court bailiff, a nephew of the judge, while he secured collateral and then he paid the clerk of the court, the judge's brother, \$20 for the family purse.

"Quite a family affair you've got here, your Honor," the motorist told the judge as he departed. "Yes," said the judge, "but if you'd had to go to jail, you would have met my father, the jailer," he rather proudly replied.

NEW BODY PLANT COMPLETED

LOUISVILLE, Ky., Aug. 31—Construction of the \$1,000,000 plant of the Mengel Body Co., which will make commercial automobile bodies for the Ford, Star, Chevrolet and Overland automobiles, has been completed, machinery installed, and formal opening has been set for Sept. 1.

Starting with a production of about 500 automobile bodies a day and employment of about 500 workers, in addition to turning out thousands of parts for automobile bodies for shipment to other cities for assembling, production will be increased from time to time and more workers employed, according to William Hoge, vice-president of the company.

SEIBERLING BUYS PLANT

AKRON, O., Sept. 1—Purchase by F. A. Seiberling, founder of Goodyear and now president of the Seiberling Rubber Co., of the Barber Cement Products Co., and a tract of 80 acres of industrial land in Barberton, is reported although the report lacks official confirmation due to the absence of Seiberling who now is in California. It is understood Seiberling is considering the establishment in the Barber cement plant, of a rubber reclaiming plant to serve his own rubber factory and other rubber factories in the Akron district.

George C. Scobie Re-elected President of Earl Motors

Company Continues Production—Brokers Drop Plan to Buy Bank Creditors' Claims

DETROIT, Sept. 3—Earl Motors will continue to manufacture cars for at least some time longer according to President George C. Scobie, re-elected to that position at a directors meeting last week. What the future manufacturing policy of the company will be Scobie said had not been determined yet but for the present the company is making cars, and in addition, is also making parts and supplies for other car and parts companies.

Earl cars are being advertised for sale at retail here at \$300 under the list price, but this, according to Scobie, is only a local proposition and he said no reduction from list prices had been made at the factory, nor is there a general reduction in prices by dealers. The company is building 10 to 15 cars daily under present schedules, he said, and is aiming at a 25 daily schedule within a short period.

Officers in addition to Scobie elected at the directors meeting were Kennedy L. Potter, vice-president, and R. A. Winks, secretary and treasurer. W. B. Stalnaker who has been sales manager under the former re-organization has resigned and Scobie said he had taken over the sales duties himself, for the time being. There were no developments in the plan whereby the bank holdings in Earl were to be taken over by a Chicago syndicate, Scobie said.

CHICAGO, Sept. 1—A. B. Maccaughey, investment broker who was head of a syndicate negotiating for purchase of bank creditors' claims against Earl Motor, the negotiations have been dropped.

Fisher Body Co. Net Earnings of \$5,806,110

DETROIT, Sept. 1—A surplus of \$4,777,682, after charges and taxes, is shown by the Fisher Body Corp. and subsidiaries for the quarter ended July 31, which is equivalent to \$7.96 a share on the outstanding 600,000 shares of no par common stock. This surplus is made up of \$5,806,110 net earnings, from which is deducted \$361,354 interest and \$667,074 taxes.

Exclusive of the Ohio company, the Fisher corporation and its subsidiaries had a surplus of \$3,696,395 for the quarter, after charges and Federal taxes. Equivalent to \$.16 a share, this compares with a surplus of \$4,020,770, equivalent, after allowing for preferred dividends, to \$7.93 a share on the 500,000 shares of no par common outstanding in the previous quarter, and \$1,733,433, or \$3.85 a share, in the corresponding period of 1922.

Accessory and Parts Sales Show Only Slight Decline

Indications Are This Branch of the
Industry Will Continue
Prosperous

NEW YORK, Sept. 3—Feeling the pulse of the industry as indicated by reports received from members of the Motor and Accessory Manufacturers Association tends to bear out the predictions that business this fall with automobile manufacturers and parts makers, too, will continue excellent.

From the listening posts comes evidence that there has been no dreaded slump. True, there has been a slight seasonal decline, if it may be called such, but ahead of the industry, in the fall months anyway, there is every reason to believe that the automobile business will pursue the even tenor of its way. Parts people report commitments extending well into October in many cases and there seems to be no such word as cancellation in automobile language. The motor car manufacturers seem eager to get in materials and they seem to be so well entrenched financially that collections are reported extra good by those concerns which furnish the necessary supplies and materials for the car makers.

This optimistic slant on immediate future business comes along with the report on July business done by members of the Motor and Accessory Manufacturers. July shows a slight falling off in sales from June—16.4 per cent to be exact—but that is not at all alarming, for the total of \$48,536,700 is considerably in advance of the \$42,000,000 total of June, 1922, and is about on a par with February of this year.

Collections continue good. July's past due accounts total \$2,313,400 as compared with June's \$2,191,150, an increase of 5.6 per cent, while July notes outstanding amounted to \$1,424,450, as compared with June's \$1,111,970, an increase of 28.1 per cent.

Holding Company Takes Over Pan Motor Co. Assets

ST. PAUL, Sept. 1—Property of the defunct Pan Motor Co. of St. Cloud, Minn., has been taken over by the St. Cloud Holding Co., incorporated for \$50,000. The properties were sold recently to creditors' and stockholders' committees at a receiver's sale in St. Cloud for about \$400,000. Among the incorporators of the new company are C. F. Ladner, Fred Schlipplin and C. D. Schwab, who were directors of the old Pan Motor Co. They were defendants in the suit the government brought against S. C. Pandolfo, president and organizer of the Pan company, for misuse of mails, but were acquitted. Pandolfo was convicted, however, and was sent to Leavenworth for 10 years.

Children's Auto- motive Toys Must Have Licenses

BRIDGEPORT, Conn., Sept. 1—Children's vehicles, propelled or drawn by any power but muscular, must be registered and carry regular automobile plates when used on Connecticut highways, according to interpretation of the state motor vehicle statutes by Commissioner Robbins B. Stoeckel and other officials of his department. The ruling was made necessary by the fact that during the past few months a number of such vehicles equipped with small gasoline motors have been bought by parents throughout the state for use of their children. Officials having charge of regulating motor vehicle traffic found themselves confronted with a perplexing problem and put it up for solution to the state department.

States at Loggerheads Over Licenses for Trucks

WASHINGTON, Sept. 1—Upholding a previous ruling that West Virginia, under its present law, must force commercial vehicles from other states to obtain state licenses before operating on West Virginia highways, E. T. England, attorney-general of that state, in telegrams to the Automobile Club of Maryland, the District of Columbia, and the Washington and Baltimore Automobile Trade Associations, has informed them that the only egress from the law remains in the power of the States Road Commission of West Virginia.

A telegram also was received by the Washington Automobile Trade Association, from the governor of Virginia, to the effect that Virginia was willing and anxious to adjust the difficulty and agreed to attend any conference which might be called on the subject.

At a special meeting this week of the Baltimore Automobile Trade Association steps were taken to call a conference of the officials of the three states surrounding West Virginia in case the ruling of the attorney-general of West Virginia is enforced. The Washington Automotive Trade Association has also announced that it will be represented.

CHEVROLET PRICE REDUCTIONS

DETROIT, Sept. 4—The Chevrolet Motor Co. has announced the following reduced prices which it is declared are made possible by increased production facilities and consequent economies.

Roadster	\$490
Touring	495
Utility Coupe	640
Sedan	795
Commercial Chassis	395
Light Delivery	495
Utility Express Truck Chassis....	550

The reductions are said to be in conformity with the company's policy of lowest possible prices consistent with high values.

Night Highway Illumination for Lincoln Ideal Section

Reflectors Designed to Throw 3,700
Candlepower From Single
Lamp on Roadway

DETROIT, Sept. 1—Working to solve the problem of illuminating highways for night traffic, the Lincoln Highway Association has accepted a lighting system which has been developed for it by the General Electric Co. and which will be installed along the Ideal Section of the famous coast-to-coast trail, at Dyer, Ind., near Chicago.

W. D'Arsey Ryan, chief engineer of the General Electric Co. of Schenectady, N. Y., is credited with the development of this new system, which is said to embody a new principle for collecting the light rays and casting them only where needed, which is along the roadway and not on the fields adjacent. A nest of reflectors is provided—a series of three—one within the other. These reflectors serve to cast the light which otherwise would be reflected upward and outward upon the surface of the road, while at the same time shielding the direct rays from any possibility of glare in the eyes of the drivers.

The General Electric Co. engineers state that 3,700 candlepower is obtained from each side of the reflector with only a 250 cand'epower lamp in the fixture, which is known as the Nuvalox. The bracket holding the lamp and reflector is affixed to an ornamental pole 35 ft. high and is adjustable in both horizontal and vertical positions, permitting the best illumination on curves and grades. One of these units will be installed in alternate positions on each side of the road and all wires will be underground. The lamps will be controlled by an entirely automatic oil time switch, which can be adjusted to turn them on and off at any determined hour in the evening and in the morning.

The association plans to illuminate the highway from one-half hour after sunset to one-half hour before sunrise.

RIGHTS OF ONE-ARMED DRIVER

BALTIMORE, Sept. 1—A second effort is made to get the Maryland courts to decide whether a man with one arm should be permitted to operate an automobile in the state. Some time ago a veteran of the World War, who lost an arm, attempted to secure a license and when it was refused through the office of the State Motor Vehicle Commissioner, he took the case into court. The jury failed to agree. It is said that he now plans to make another effort to get court action.

S. A. E. TO MEET JAN. 22-25

DETROIT, Sept. 3—The next annual meeting of the Society of Automotive Engineers will be held here Jan. 22 to 25 at the time of the Detroit automobile show. The sessions will be held in the General Motors Building.

Investigations Now in Order for the Gasoline Business

Demands Made for Inquiry Into Methods of Standard Oil—Over- production Blamed for Price Drop

NEW YORK, Sept. 1—Apparently the gasoline situation has passed the price-cutting stage, for developments this week have been more in the nature of threatened investigations and talk of over-production by the big refiners. The demand for a probe comes from Minneapolis, where the National Association of Attorneys General has been meeting, representatives of Kansas and Oklahoma asking for a nation-wide investigation to determine "if the Standard Oil Co. is manipulating the gasoline market to put 40,000 mid-country producers out of business."

A. C. Bedford, chairman of the board of the Standard Oil Co. of New Jersey, is the one to sound the note of warning as to over-production, declaring in a speech at Titusville, Pa., that the oil industry is in a crisis at the present time because of the surplus amount of gasoline.

Bedford declared that gasoline stocks had showed a gain of 50.32 per cent between Jan. 1 and May 31, and that production for the same period was 33.55 per cent over the same months of 1922. Gasoline consumption in 1922, he said, averaged 12.5952 barrels per motor vehicle. With 14,500,000 cars registered at the end of the year, he predicted this year's consumption will be 182,630,950 barrels.

Discussing the crisis, Bedford declared: "Whatever the outcome, and it cannot be more than approximately foretold, the extent of the problem of enormous storage for either crude or for gasoline must rest upon the results of such expedients as already resorted to, such as the reduction in price of certain grades of crude, the pro-rating of runs and other steps designed to curtail production. If the task of financing and carrying over a huge surplus of either crude or gasoline is forced on the industry, it will undertake and accomplish this as it has before undertaken and accomplished tasks beyond its apparent capacity. It is an economic problem which as vitally affects the gasoline consumer of the future as the gasoline user of today, and in a highly competitive business such as the oil industry its ultimate solution will rest with the law of supply and demand."

Unequal Gasoline Prices Subject of U. S. Inquiry

SAN FRANCISCO, Sept. 1—Federal investigation of the over-production of crude oil in the California fields, and the relation of that over-production to the present high price of gasoline in northern California as compared with prices in southern California, has been under-

taken by Henry A. Guiler, special assistant to the United States Attorney General here, and head of the government's anti-trust bureau for California. Guiler and a force of Department of Justice operatives have been at work in the oil fields for some weeks.

Evidence has been adduced showing that storage facilities in the California fields have been taxed to capacity, and that a number of producing wells—whose production would have resulted in a reduction of the price of gasoline—have been shut down by the companies, rather than construct more storage equipment. It is charged by the federal agencies that refineries are not running to capacity; that if the refineries were running to capacity, there would be a heavy reduction in the retail price of gasoline; and that there has been sufficient production to keep all the refineries busy all the time, if the companies had allowed them to be operated at capacity. Gasoline has sold as low as 6 cents a gallon in Los Angeles, and as low as 11 cents in other southern California cities, but has not dropped below 17 cents in San Francisco or other northern California points.

JOINS U. S. AUTOMOTIVE DIVISION

WASHINGTON, Sept. 1—Howard H. Tewksbury, formerly Assistant Trade Commissioner in Havana, Cuba, in 1921 and 1922, has gone with the Automotive Division of the U. S. Department of Commerce, in charge of publicity and publications of the division, under M. H. Hoepfl, acting chief. He will have active charge of preparing the Automotive Foreign Trade Manual which is being prepared at the behest of the automobile industry and as an adjunct to the securing of more foreign trade in the automobile export field.

Tewksbury was selected for the position appointed to by virtue of the fact that he is not only familiar with Trade Commissioners' work abroad but through a two year experience gained through his affiliation with the General Motors Export Company in 1919 and early part of 1921. He is an A. B. graduate of Harvard, 1918.

WILL VISIT FOREIGN SHOWS

NEW YORK, Sept. 3—Engineers of General Motors units will attend both the Paris and London shows, reservations having been made on the Majestic which sails Sept. 22. Included in the party are H. H. Bassett, general manager, and F. A. Bower, assistant chief engineer, of the Buick division; B. Jerome, chief engineer of Oakland; W. R. Strickland, assistant chief engineer of Cadillac; R. T. Jack, chief engineer of Oldsmobile; H. W. Moyse, chief engineer of General Motors of Canada; and Lawrence Fisher and Alfred J. Fisher of the Fisher Body Corp. On the other side the party will be looked after by W. O. Kennington, chief engineer of General Motors of London, who has made arrangements for visits to leading English and continental factories in addition to taking in the automobile shows.

Great Increase in Demand for Public Garage Space

Thousands of New Cars in Philadelphia Cause Enormous Expansion in Motor Trade

PHILADELPHIA, Sept. 1—The demand for sites for public garages is tremendous and requests for garage accommodations are far ahead of the supply, despite the almost constant erection of new public garage buildings. In the last six months, also, permits for the building of several hundred private garages have been issued. The high cost of construction has operated against the building of garages in certain sections where land values are very high also. Fall will doubtless witness increased garage-building activities.

There are numerous large garages on Twenty-second street, north of Arch street, and several more are to be built there. It is not more than twenty-five years since the first automobile appeared in the streets of Philadelphia, and since then at least \$150,000,000 has been expended in local real estate, either by purchase or improvements, to supply the needs of the automobile trade.

The automobile business has been making rapid advancement as regards sales and service stations, garages, accessory stores and oil-filling stations of late and promises to outdo the automobile centers of Market street in the twenties and Chestnut street near the Baltimore & Ohio station. Oil filling stations are going up in many sections of the city, almost weekly, many being of an ornamental character.

15 Harvard Students of Business Visit Cadillac

DETROIT, Sept. 1—A group of 15 students and post-graduates of the Harvard School of Business Administration were recently guests of the Cadillac Motor Car Co., where they were taken on a trip of inspection to study production methods in the factory.

H. H. Rice, Cadillac president, gave them a short talk upon the value of charts and records, showing the state of fundamental business conditions and giving data upon which to forecast future tendencies. He warned the students that theoretical knowledge must be tempered by years of business experience before it becomes of the greatest practical value, citing various forecasts of a slowing down in the automobile business, all of which have failed to materialize.

FORD SHOW AT MEMPHIS

MEMPHIS, Tenn., Sept. 1—There will be a Ford and Fordson show at the Tri-State fair here, Sept. 22-29, under canopy 90 by 300 feet, and backed by the 226 Ford dealers in the Memphis territory.

Expansion and Changes Mark Progress in Boston

New Buildings on Motor Row Are Occupied As Soon As Completed

BOSTON, Sept. 1.—Motor expansion continues in Boston, and the real estate men find that they have customers for the new buildings as soon as they go up. Before the new structure was finished on Commonwealth avenue near St. Paul street two sections of it were taken over by the splitting up of the Lincoln and Ford housed across the street further up. The third section is under lease.

Landlords who have property where the leases are running out are putting up the price. In one building where two motor companies are housed the tenants were asked to pay 25 per cent more. And the owners had quietly gone around to some of the other dealers asking if they did not want to lease the property over the heads of the present tenants. But the dealers so approached not only turned the offers down, but in some cases made an offer 20 per cent lower in rent than those in the places now pay.

At least two of the big companies are looking for new places on the avenue, and it looks as if they will have to wait until something is erected for them next year.

W. W. Haskell and Charles A. Bouchard, who have taken on the Rollin for eastern Massachusetts, are busy supervising the reconstruction of the building at 820 Commonwealth avenue, formerly the home of the United Motors, and in another week they will have their furniture in and the sign over the door, ready to confer with dealers and answer queries about the new car.

A. H. Sowers, former Lexington distributor for New England, is seeking a place on the avenue where he can arrange to have retail distributors handle the Monroe and Anderson lines that he represents in the territory now. He has two places under consideration.

The Metropolitan Motors Company, which was one of the prominent firms dealing exclusively in used cars at 878 Commonwealth avenue, has gone into the hands of receivers.

John W. Patterson, vice president of the Hinchcliffe-Patterson Co., New England distributors for the Jordan car, has sold out his interest in the company and gone West, where he will continue in the motor business. The firm name has been changed to the Hinchcliffe Co.

Clarence D. Williams, retail sales manager for the C. E. Fay Co., handling the Maxwell-Chalmers line, has resigned to accept a similar position with the Hinchcliffe Co.

Rolliston W. Linscott, owner of the Linscott-Reo Co., of Melrose, Mass., has sold the business to Lieut. Commander E. P. A. Stimpson, United States navy, resigned, who has taken it over. Linscott has joined his father, James M. Linscott,

Reo distributor for New England, and he will have charge of the passenger car sales, the company doing such a big business in speed wagons now that one sales manager could not handle both lines.

The Case Motor Car Co. has moved into new quarters on Brookline avenue, near the American League baseball park. And the Boston Motor Co., distributors for Gray and Columbia cars in the retail Boston territory, has opened a service station, in charge of Archibald Smith, at 19-23 Jersey street, in that district.

The Federal Motor Truck Co. celebrated with an open house day and evening last week on the completion of reconstruction work which enlarged its sales and service building on Massachusetts avenue, Cambridge, where it had outgrown its old quarters. It now has one of the finest salesrooms in the motor truck district.

The Sills-Chevrolet Co., New England distributor for the Chevrolet line, has torn down the one-story building adjoining its service station, and in its place is erecting a three-story structure in which to house its clerical and executive forces.

Got Tire by Fraud; Pays for It a Year Later

HARTFORD, Conn., Sept. 3.—A year ago a motorist, without funds and in need of a tire, entered the Connecticut Tire Exchange at 1066 Main street, this city, and received the goods he wanted by what he admits to have been "dishonest methods." Early this week Morris Glazer, proprietor of the establishment, received restitution in the form of a \$10 bill sent in a letter, by special delivery, to his business address. The letter failed to reveal the name of the conscience stricken person.

Hearne Wins Altoona Race; Howard Wilcox Fatally Hurt

ALTOONA, Pa., Sept. 4.—Driving the 200 mile grind without a stop, in his Durant Special, Eddie Hearne today won the first race on the new Altoona Speedway. His time was 1 hour, 47 minutes, 37 35/100 seconds, an average speed of 111½ m.p.h. Jerry Wonderlich, also in a Durant Special, came in second, with David Lewis, in a Duesenberg Special, third.

"Howdy" Wilcox Dies

Driving in third place at a speed of 100 m.p.h., "Howdy" Wilcox, veteran driver, while rounding a curve on the 107th lap, in his Duesenberg Special, threw a wheel and upset. It is estimated that 50,000 persons witnessed the accident in which Wilcox, winner of the Indianapolis Sweepstakes in 1919 and one of the most admired of American race drivers, sustained injuries to his back and neck, which caused his death while being taken to an emergency hospital nearby.

Twice as Many Cars Sold in Oregon as Last Year

Average of 1235 Cars a Month Sold This Year in Multnomah County Alone

PORTLAND, Ore., Sept. 1.—Automobile sales in Oregon have shown a tremendous gain thus far in 1923 as compared with the corresponding period of 1922, according to figures which have just been tabulated and made public by the Wilkins' Automobile Information Service of Portland.

For the first seven months of 1923, or until the first of August, nearly two and one-half times as many cars were sold in Oregon as during the first seven months of 1922, according to the report, which showed an average daily sale of cars for the period this year for Multnomah county (Portland) of 42 and for the rest of the state of 61, making an average daily sale for the entire state of 103 new cars. This compares to an average of 47 new car sales per day for the same period in 1922 for the entire state, a gain of 202 per cent this year over last. This average daily sale of 103 cars since the first of January this year is thought to compare favorably with sales in any other part of the country, in proportion to population.

July Peak Months

The peak month of 1923 thus far has been July, according to the report, with 5,456 sales of new cars, as compared with 3,243 cars sold during July, 1922. Owing to the holdback in June on account of the half-year license fee going into effect on July 1, June and July should be compared together. Totaling the two months of each year gives 7,352 new cars sold in June and July this year, as compared with 4,336 in June and July, 1922.

The average number of new cars sold in Multnomah county thus far in 1923 has been 1,235 cars monthly, and 1,890 cars for the rest of the state, or a total of 3,125 monthly. The total sale of new cars in Multnomah county during the seven-month period has been 8,679 cars, and for the rest of the state, 13,294. In view of the sales thus far an estimate of over 30,000 new cars sold for the entire year 1923 has been made. Should this be reached it would easily constitute a record figure for the state of Oregon for new car sales in any one year.

Sales by Months

A tabulation of the sales of new cars by months thus far this year, and a comparison of the sales this year to the corresponding months of 1922 is given as follows:

Month	Sales, 1922	Sales, 1923
January	449	1,974
February	658	1,440
March	1,264	3,692
April	1,409	3,819
May	1,742	3,596
June	1,093	1,896
July	3,243	5,456
Totals	9,871	21,873

Collins Proceeds With Plan for 6-Cylinder Car

Will Keep All His Associates in Peerless Organization, With Support of Stockholders

CLEVELAND, Sept. 3.—Fortified by a vote of confidence by his stockholders and further bolstered by the importunings of his directors to remain and continue the work of directing as president the affairs of the Peerless Motor Co. in this city, Richard H. Collins stated that his entire group of associates that he brought with him from Detroit and took over from the group of old Peerless employees, would remain with him to carry out expansion plans that have been laid out.

With Collins thoroughly acclimated to his new position, and with Peerless affairs at his finger tips, Cleveland men interested in the plant are expecting a far more vigorous campaign in the near future than has ever before marked the company's production and sales efforts.

Collins stated that he will market the Collins six, in addition to the Peerless eight-cylinder car, and with a distributing medium in existence that ranks among the most effective, a good market for the new six car is assured, in the opinion of Cleveland men who have backed Collins to the limit.

The president of Peerless declined at this time to give definite information as to when the new six car will be ready to market, or at what price it will be built. That it will be a medium priced car is fairly well assured.

Cleveland bankers and business men interviewed are pleased at Collins' decision to remain. He and his associates have the ability to progress much further with the company than has been possible since they assumed control 22 months ago, during which time its progress has been one of the outstanding features of the automobile world, said the president of one of the largest local banks.

GOODYEAR ENDS 25TH YEAR

AKRON, O., Sept. 1.—The Goodyear Tire & Rubber Co., on Aug. 29 celebrated its twenty-fifth anniversary. Officials of the company quietly celebrated the birthday. Employees will hold their celebration on Labor Day.

Goodyear since being founded a quarter of a century ago by F. A. Sieberling has grown to be one of the largest companies in the world, has established its own rubber plantation in Sumatra, its own cotton plantation in Arizona, and operates tire factories in California and Canada. In addition to several million solid truck tires, thousands of miles of belting, tubing and hose, and many hundred millions of rubber heels, the company has made more than 55,000,000 pneumatic tires,—or more than have been manufactured by any other company in the world.

Tractor Starts on Long Distance "Crawl"



WATERTOWN, Wis., Aug. 29.—A Monarch tractor, made by Monarch Tractors, Inc., was started yesterday from the factory on a trip of 490 miles to visit large fairs. This long distance "crawl" is the second undertaken by this tractor, called "Old Sparkie" by its driver, the machine having made the trip under its own power last year from Watertown to New Orleans, a distance of 1513.3 miles.

The tractor is scheduled to arrive at Milwaukee in time for exhibition at the Wisconsin State Fair, Aug. 27 to Sept. 1. It is to be at the Illinois State Fair at Springfield, Sept. 15 to 22, and at the National Implement Show at Peoria, Ill., Sept. 28 to Oct. 6. Many other stops are scheduled at intermediate points.

The tractor is driven by "Blondy" Sorenson, the same driver who guided it on the trip to New Orleans.

GEORGIA SALES INCREASE

ATLANTA, Ga., Sept. 5.—A remarkable increase in automotive sales in Georgia from Jan. 1 to Aug. 15, inclusive, as compared with the corresponding period in 1922, is shown in a report by the Georgia Motor Vehicle Department, issued the latter part of August.

Up to Aug. 15, 1923, there were 141,086 passenger cars registered with the department, and 18,001 commercial cars, the report shows, as compared with 119,484 passenger cars to Aug. 15, 1922, and 15,972 commercial cars. This is an increase in passenger cars of 21,602, and in trucks of 2,029, and will represent proportionately the increase in automobile and truck sales made by dealers throughout the state during this period.

NEW MILLER CORD

AKRON, O., Sept. 1.—The Miller Rubber Co., announced a new 30 x 3 1/2 cord tire with flat tread to sell at practically fabric tire prices. Miller engineers say the flat tread construction will give a 20 per cent greater service than the round tread tire, and will afford additional cushioning and easier riding. The new tire is also featured by a special sidewall construction of tread stock running from bead to bead. This feature is designed to give additional protection from rut wear and curb chafing.

TIRE EXPORTS DECLINE

WASHINGTON, Sept. 3.—Export of automobile casings during the month of July shows a big decline over the previous month. July exports were 98,290, compared with 144,556 in June, figures of the U. S. Bureau of Foreign and Domestic Commerce show.

Will Soon Deliver First of One-Ton, Cab Body Trucks

DETROIT, Aug. 31.—Ford Motor Co. will make first deliveries of its one ton truck equipped with cab and body the latter part of September or the early part of October, according to present indications. Prices on the complete job have not been set as yet and will not be set until the model is about to make its appearance, according to factory executives.

Appearance of the heavier Ford truck on the market has been set back largely because of the company's plans for bringing out its light truck completely equipped. There is possibility of the heavy truck being introduced late this year, but executives declare that plans on this are in abeyance pending the completion of other matters which the company now has in progress.

Details of the heavy truck have not been officially disclosed. It is understood however, that it will be of two and half ton size with the Fordson engine as the power plant.

CHICAGO HAS TRAFFIC TOWERS

CHICAGO, Aug. 30.—Chicago's new automatic traffic signal system for Michigan boulevard, modeled after New York's Fifth avenue system, has been completed and will be in regular operation as soon as it has been fully tested. Towers have been erected at all intersections from Randolph street to Twenty-second street, with three master towers at regular intervals. This system is expected to greatly facilitate traffic on the crowded thoroughfare.

Tire Makers Lower Schedules, But Market Remains Flooded

Drastic Steps Taken by Some Concerns to Move Large Inventories This Fall

AKRON, O., Sept. 1—Manufacturers in the Akron district still are feeling the effect of the recent sluggish movement of tires through trade channels, and are seeking to liquidate abnormally heavy finished goods inventories before entering upon fall production schedules.

Few companies are laying off men now. And none are adding to their forces. Tire sales have shown some improvement and stocks are moving in better shape from factory warehouses. But until inventories are back down to a right balance, it is not expected that Akron manufacturers will increase factory forces and launch higher production schedules.

Many companies are resorting to drastic efforts to move tire stocks.

The Mason Tire & Rubber Co. has adopted a strict cash-to-dealer plan of distribution and reports that the new system is bringing in new accounts at the rate of more than 1,000 a month, and cash collections averaging \$50,000 a day. Mason dealers are being urged to carry not more than two weeks' tire stocks.

The General Tire & Rubber Co. is carrying on a strong campaign to urge manufacturers to discontinue announcing tire price reductions. Five thousand or more dealers have replied to a circular letter sent out by the General company urging dealers to join the movement to influence manufacturers in abolishing the practice of advertising price reductions and, according to Wm. O'Neil, vice president and general manager, out of the 5,000 replies only three dealers oppose the plan.

Perhaps never before in the history of the tire business are dealers being so swamped with circulars from manufacturers as today. The General company sent its circular letter to 77,000 dealers and followed it up with other letters. Mason is also circularizing thousands of dealers with the cash-to-dealer plan. Firestone recently had printed and mailed to dealers 388,000 copies of 50 different letters.

Actual tire production in Akron today is far below the peak of 110,000 tires daily, established a few weeks ago. More than 5,000 men have been dropped by the tire factories since July and production is not believed to be more than 60,000 a day, if it is that high.

Dealers as well as manufacturers are overstocked. The recent price reductions instead of stimulating tire sales, greatly retarded them, the motoring public holding off on anticipated purchases in expectation of subsequent price cuts.

There are repeated rumors of other price cutting movements in contemplation, but it is stated with reasonable au-

thoritativeness that there will not be another tire price reduction for some time to come. Manufacturers say tire prices now are too low and that the last price cut was a mistake.

Rounding Up 1000 Dealers in Iowa



A. J. KNAPP

Secretary and manager of the Iowa Automotive Merchants Association, under whose management the association has grown to the point where its directors believe it will have 1,000 members by Dec. 1.

A. B. A. BUS SECTION

DETROIT, Aug. 31—A bus section of the Automobile Body Builders' Association was formed at the meeting here this week, with F. E. Cullison of the Plymouth Wagon Works as chairman. Formation of a commercial body builders' division was deferred until a later meeting to be held at about the time of the national automobile shows or a national truck show. In the meantime manufacturers in both classes who met here this week will work on organization and membership plans.

ELECTRIC ASSOCIATION TO MEET

CLEVELAND, Aug. 30—The summer meeting of the Automotive Electric Association will be held September 11 to 14 at Eaglesmere Park, Pa. Headquarters will be at the Forest Inn. The various committees which have been making investigations during the year will make their reports and some considerable time will be given to the subject of service and specialized service. A program of sports has also been prepared.

ROAD SHOW PLANS MADE

CHICAGO, Sept. 1—Plans for the 1924 convention and road show of the American Road Builders' Association have been practically completed. These two events are to be held in Chicago simultaneously the week beginning Jan. 14. The convention headquarters are to be in the Congress Hotel. The road show will be held in the Coliseum and the adjoining Greer building. Charles M. Upham has been appointed manager of both the convention and road show.

Mohawk and Star Rubber Companies Agree on Merger

Stockholders of Tire Concerns to Meet Sept. 29 to Act on Proposed Plan

AKRON, O., Aug. 31—Merger of the Mohawk Rubber Co. and the Star Rubber Co., both of Akron, virtually has been agreed upon by directors and officers of both companies, and now awaits only the ratification of stockholders. Stockholders' meetings have been called for Sept. 29 to ratify the proposed merger and notices with blanks for votes by proxy have been sent to all shareholders.

Under the proposed merger the Mohawk company will virtually absorb the Star company, paying Star stockholders 8,190.72 shares of Mohawk preferred stock and 17,321.65 shares of Mohawk no par common stock, and assuming all obligations of the Star company.

It is proposed to increase, by vote of the stockholders, the capitalization of the Mohawk company from 47,500 shares, consisting of 25,000 shares of no par common stock and 22,500 shares of preferred stock with a par value of \$100 each, to 70,000 shares, consisting of 40,000 shares of no par common stock and 30,000 shares of preferred stock.

The two companies are doing a combined business of about \$5,000,000 a year. Both the Star and Mohawk lines of tires will be continued under the merger and for the time being both plants will be operated.

Murphy Moves to Milan to Prepare for European Race

PARIS, Aug. 11 (By Mail).—Jimmie Murphy, arriving here a week ago, has moved down to Milan to prepare for the European Grand Prix 500-mile race. Twenty cars have been entered for this race, which will be run on the Monza track on Sept. 9. The firms represented are Fiat (3), Alfa-Romeo (3), Benz (3), Steiger (3), Voisin (3), Rolland-Pilain (2), Miller (3).

While little is known of the ability of the German cars, it is expected that the real fight will be between the Fiats and the Millers, the favorites being Pietro Bordino and Murphy. There has been considerable comment on the refusal of Mercedes to enter this race on the grounds that Italy has tacitly approved the action of France in the Ruhr. Sunbeam, the winner of the French Grand Prix, objects to the use of superchargers on limited piston displacement engines. In filing his entry Gabriel Voisin declares that he has no expectation of winning, but being convinced that France ought to have a speedway, he is taking part in this race for the lessons to be learned from it.

Before returning to America it is expected that the three Miller cars will race early October on a new track now building near Barcelona.

Newark Trolley Strike Shows Bus Superiority

Motor Vehicles Carry New Jersey Passengers with Dispatch and Safety

NEWARK, N. J., Aug. 31.—Three weeks of idleness for the trolleys, caused by a strike of employees that was state-wide and which forced the residents of the state of New Jersey to turn to motor transportation, has demonstrated the ability of the motor bus and the jitney bus in a manner that is most satisfactory to those who demand the abolition of the trolleys as one means of solving the traffic problems of the present day.

This is particularly noticeable in Newark, the fourteenth largest city in the United States, in which there are 400,000 people who heretofore have had to depend upon the trolleys for transportation. With the coming of the strike, those 400,000 discovered that the motor vehicles can carry the transportation burden without semblance of disorder and with dispatch.

An investigation of the situation shows that without trolleys street traffic was about 35 per cent faster than before, a fact that has materially aided the cause of the bus operators. Speeding up the vehicles, congestion has been reduced to a minimum, mainly because of the 15-foot space occupied by the trolley tracks which now can be used by the automobiles, thus leaving the curb and the space between it and the tracks open to vehicles which are planning to make stops along the way. Vehicle parking, too, was greatly simplified because of the greater street space available.

Although the strike was virtually settled the last week in August so far as the traction company and the employees were concerned, the motor buses continued to operate. The traction company submitted a plan in which it proposed to operate buses as feeders, provided it be given the exclusive right of passenger transportation on streets on which rails are laid.

As proof of the manner in which the bus interests have met the present emergency, it is pointed out that they handled 300,000 more passengers a day than before the strike. This was done at the old five cent rate, which is three cents lower than the trolleys charged and yet it applies to the same territory. There are seventeen bus lines paralleling existing street car tracks, an aggregate mileage of 130 miles. None of these routes is less than five miles in length and some are ten.

The Newark buses are being operated under the direction of the New Jersey Auto Bus Association, which prior to the strike had 500 of these vehicles in operation, carrying 200,000 daily. When the strike was declared 50 buses were brought from New York and 125 from Connecticut and other states. All of these buses were subsidized by the asso-

ciation at the rate of from \$40 to \$60 a day, according to the seating capacity of the buses, which is in the nature of a guarantee.

The 17 bus lines operate under a system of profit pooling, drivers being allowed to hold out a fixed sum, according to the size of the bus, from the daily earnings. Profits exceeding that amount are turned into the association. If the day's receipts do not equal the amount named, the association pays the difference. So far, however, the system has worked so well under the pooling system that these guarantees have been paid out of the profits.

3,118 Cars an Hour Cross Boul Mich Bridge

CHICAGO, Sept. 1.—Chicago claims its famed Michigan boulevard is the most heavily traveled automobile thoroughfare in the world. A recent count by city employees showed an average of 3,118 cars an hour crossed the Link bridge over the Chicago River between 7 a. m. and midnight. During the day cars crossed at the rate of 52 a minute and in the evening, from 5:15 to 6:15, the rate was 72 a minute.

Michelin Puts "Balloon" Tires on Market in France

PARIS, Aug. 16.—(By Mail.)—Michelin will place low pressure balloon tires on the market at the opening of the Paris automobile show in October. The French tire maker's activities in this direction had been kept a profound secret until this week when he presented to the leading automobile manufacturers a perfected type of "comfort tire," as he has designated it, to be used on small, light cars. Instead of the normal 50 to 60 pounds pressure they are only inflated to 18 to 20 pounds pressure.

Makers who have tried out these tires on their cars are enthusiastic regarding them and have already given orders for their show models to be equipped with "comfort tires." Michelin states that he has no intention of confining himself to the present sizes, but has begun at this end of the scale because the necessity for big low pressure tires is much more pronounced on cars weighing 800 pounds than on 2000 pound machines. The price of the new tires has not been announced. It is denied by Michelin that he has any intention of producing straight side tires.

FILM TO TEACH SAFETY

ST. LOUIS, Aug. 31.—A film entitled "A Day With a Careless Driver" was made in the court room of Judge Calvin Miller here last week under the auspices of the St. Louis Safety Council. It is intended to show the film in schools and other public places this winter.

BUSINESS NOTES

Inland Automobile Co., manufacturer of convertible passenger and truck bodies for cars, has started building a plant near Flint, Mich., to which it will move from Columbus, Ind., about Oct. 10. C. C. Knudson is president of the company. The company will specialize in a convertible body for use on light chassis in the Ford, Chevrolet, Overland, Gray and Star class, affording a five-passenger touring or half-ton truck as desired.

Baron Caldwell Co., Ford and Lincoln distributor at Rock Hills, S. C., has let contract for a new building to cost about \$25,000.

A suit for receivership has been filed against the St. Louis Automotive Co., 3327 Locust street, St. Louis, in behalf of John I. Gerdes, 15 years old, of Alton, Ill., by his mother, Mrs. Catherine Gerdes. The petition alleges that she invested \$13,459 of a trust fund which she, as her son's guardian, had in her care, in the company upon representations of John Neskov, president of the company.

The Oldsmar Automotive Accessory Corp., recently formed at Oldsmar, Fla., has acquired the plant of the Oldsmar Manufacturing Co., including a large foundry and machine shops, and is remodeling the plant for the manufacture of automobile parts and accessories, principally Ford accessories. The principal products of the factory will be a fan belt pulley guide, a driving compartment ventilator, and a centrifugal water pump.

The National Standard Co., of Niles, Mich., has purchased a 5-acre tract of industrial property in North Akron, O., including the two-story brick building of the B. & W. Rubber Co. The acquired Akron factory will be re-equipped at once with machinery for the manufacture of tire bead wire, according to officials of the company, and will be operated as a subsidiary of the parent company which now operates a million dollar plant at Niles. The Akron plant will be in operation within 60 days.

The Toursedan Corporation, 104 West Mt. Royal avenue, Baltimore, has been incorporated with capital stock of 20,000 shares, par value \$10, to manufacture, sell and install convertible enclosures for automobile tops.

The Auto Illuminating License Co., 215 Equitable Building, Baltimore, has been incorporated with \$100,000 capital stock to manufacture an illuminated license tag holder.

The Acushnet Process Co., operating a large rubber reclaiming plant at New Bedford, Mass., has opened western offices in Akron, O., with John Lyon in charge. Lyon formerly for several years was with the Federal Rubber Co.

Motor Truck Industries, Inc., Studies Parts Distribution

DETROIT, Sept. 1.—To further improve parts distribution and service conditions, Motor Truck Industries, Inc., at a directors' meeting here this week, named a special committee which will make a study of the conditions now existing and report back to the directors Sept. 26. The committee is composed entirely of truck manufacturers, as follows: E. A. Williams, president of Garford, chairman; A. S. More, president of Selden; W. A. Kysor, president of Acme, and M. L. Pulcher, vice president of Federal.

Working with this committee will be the following representatives of parts manufacturers: A. E. Parsons, Brown Lipe Gear Co.; George W. Yeoman, Continental; Fred Glover, Timken, and C. A. Dana, Spicer.

Date for the annual meeting of the association was set for Nov. 21, probably in Detroit. At that time the report of this committee on improved parts distribution, following its approval by directors, will be submitted and recommended for adoption.

CONCERNING MEN YOU KNOW

W. O. Rutherford, vice-president in charge of sales of the B. F. Goodrich Co., and president of the Rubber Association of America, is making an extensive survey of trade conditions on the Pacific Coast.

Fordyce Jones, chairman of the Reliance Rubber Co., of London, England, is enroute to the United States and is expected to be in Akron the forepart of September. He will make a study of the rubber industry while in this country.

Shelby Falor, former president of the Falor Rubber Co., of Akron, has become sales manager for the Columbus Tire & Rubber Co., at Columbus, O. His company, which manufactured inner tubes exclusively, discontinued business several weeks ago. Falor formerly for 20 years was a member of the board of control of the Goodyear Tire & Rubber Co.

Henry Farrington, formerly with the Better Tires Co., of Chicago, has been named advertising manager of the Mason Tire & Rubber Co., at Kent, O. Farrington formerly was technical editor of Popular Mechanics Magazine, and editor of Power Wagon.

F. F. Dugan and C. L. Mason, formerly officials of the Denman-Myers Cord Tire Co., of Warren, O., have severed connections with that company and have established the partnership of Dugan and Mason. They have opened offices at 109 N. Union street in Akron and will handle rubber factory supplies of all nature.

Hugh Minter has taken charge of the Lincoln sales department of the J. W. Thompson Co., Baltimore. He was formerly connected with the sales staff of the Baltimore Cadillac Co.

Ross C. Dick, for 17 years connected with the R. & V. interests and recently production engineer for the Yellow Sleeve Valve Engine Works, Inc., has resigned to become production engineer for the Climax Engineering Co., of Clinton, Ia.

E. B. Hershberger, advertising manager of the Ford Dodge (Ia.) branch of the International Harvester Co., associated with that concern seven years, has resigned to publish a newspaper in Marcus, Wash. He had been in the Iowa branch two and a half years.

Paul R. Preston, for 12 years advertising manager for the Rock Island Plow Co., has resigned to establish a tri-city agency for the Ferry-Hanley Advertising Co. His successor at the plow has not been named.

Robert E. Pye has resigned as sales manager of Stevens & Co., of New York, manufacturer of automotive equipment, and will enter business for himself. Appointment of his successor is expected to be announced in a short time.

E. H. Fitch, receiver for the Republic Rubber Co. of Youngstown, O., before it was taken over by the Lee interests, has been chosen president of the Republic company, succeeding C. H. Booth, whose policies will be continued by his successor. Fitch's service in the industry includes 14 years as district manager of the Philadelphia division of the Diamond Rubber Co.,

following which he was at the head of the combined Goodrich-Diamond interests in Philadelphia. In 1921 he became general manager of the Republic, carrying on as receiver when the company became financially involved.

Theodore Eugene Smith, president of the Akron Standard Savings Bank, and the founder and former publisher of India Rubber Review of Akron, has retired and removed his residence to his farm at West Camp on the Hudson, N. Y. Smith was identified with the publishing of India Rubber Review for 20 years and was active in philanthropic work in Akron.

J. H. Malone, vice-president of the Hudson Motor Specialties Co. of Philadelphia, is endeavoring to find Albert M. Pearson, at one time president of the Rush Motor Truck Co. of Philadelphia and later with the Packard Motor Car Co., Gramm-Bernstein and Denby as truck salesman. Pearson's mother has asked Malone to locate her son, of whom she has heard nothing for two years.

Edward J. Rabadoux has resigned his position as service supervisor of the Metropolitan District for the Reo Motor Car Co. and has joined the sales staff of the Buick Motor Co. of New York. Rabadoux is well known in the East for his activities in service work and is president of the Automotive Service Association of New York.

F. A. Wilson-Lawrence has resigned his executive positions with the Union Carbide Corp. and its various subsidiaries, with which he has been connected since 1917 as vice-president in charge of sales of the Prest-O-Lite Co., Inc., National Carbon Co., American Eveready Works, as well as in other capacities. Too close application to business has somewhat impaired his health, hence his resignation. Lawrence will go abroad to make an intensive study of economic and business conditions in Europe and Asia for several months.

H. P. Federspiel, special sales representative at Hudson Motor Car Co., has been promoted to assistant sales manager. Federspiel has been with the Hudson organization for about a year and is well known to the distributor force.

Walter P. Hanson has been appointed advertising manager for the Stutz Motor Car Co. of America, Inc., according to an official announcement by the Stutz factory at Indianapolis. Hanson's appointment follows the promotion of H. R. Hyman to be the head of the sales and advertising departments for the same organization. Previous to joining the Stutz company, Hanson was advertising manager for the Hayes Automobile Co.

Victor W. Kliesrath, prominent in the magneto field for many years, has hung up his shingle as a consulting engineer at 120 Broadway, New York City, prepared to handle general advisory work in connection with problems of design, patents, organization, production, sales and service; to make complete investigations and appraisals for banking institutions and investors and to give assistance in financing propositions of merit. Kliesrath is a member of the S. A. E., A. I. E. E., and A. S. M. C.

WORK ON OLD HICKORY PLANT

NASHVILLE, Tenn., Aug. 31—Work has started at the Old Hickory plant here remodeling the ten factory buildings obtained by the M. B. Automotive Corporation, recently formed under Delaware laws with \$10,000,000 capital, and production at the factory is expected to begin at a comparatively early date. The total plant will provide 100,000 sq. ft. of floor space, and at the outset will be principally devoted to the manufacture of motor buses and trucks, and kindred products.

HAS NEW DEALER CONTRACT

ST. LOUIS, Sept. 1—Guy Wilson, president of the Victor Motors, Inc., has announced a new contract for dealers of his company which will not demand a deposit, nor require a definite schedule of shipment. The company intends to get estimates of the dealer's requirements without compelling him to make a specific schedule.

Some Dealers Find Profit in Dismantling Used Trucks

Manufacturers Said to Encourage Resale of Such Parts as Are Serviceable

DETROIT, Sept. 3—Removal of many used trucks from the market by dismantling them and selling such of their parts as are capable of continued service as used parts, is receiving the indorsement of truck makers. Quite a number of dealers in many lines of trucks are reported to be disposing of some vehicles in this way and with the frank approval of the manufacturer so long as the parts so salvaged are capable of more service and are sold as used parts.

Many instances are reported by manufacturers of dealers who have been doing this over a year or more at a profit. The difficulty with the system comes in confining this method of disposal only to those trucks which cannot be resold more economically and in not piling up a stock of parts by the dismantling of more trucks than the parts business of the dealer warrants. That the plan can be employed to a certain extent successfully is recognized by manufacturers and a number are passing the word on to their dealers to consider used truck allowances with this thought in view.

One manufacturer discussing the dismantling process said the average dealer is in position to do it with his ordinary service department equipment. By dismantling only trucks that are practically ready to be junked anyhow, and on which only junk allowances have been made, it does not mean that much money is to be tied up in parts. By dismantling, the dealer, too, is enabled to make somewhat better allowances than where a truck is to be scrapped by the ordinary process, and with profit to himself.

Many large users of trucks would be scrapping trucks for their parts, this manufacturer said, if it were not possible for them to get more money than they are worth by trading them in on new ones in this present stage of the truck business.

Georgia Accuses Standard of Gas Price Manipulation

ATLANTA, Ga., Aug. 30—Following a thorough investigation of the gasoline situation in Georgia, George M. Napier, Georgia state attorney general, in a letter to Gov. Walker, states that "gasoline prices in Georgia fluctuate at the nod and beck of the Standard Oil Co., which apparently has spiritual control of the situation locally."

If necessary, the attorney general stated, legal proceedings will be instituted under the laws concerning monopolies and combinations in restraint of trade, in order to effect a more nominal retail price on gasoline in this state.

Syracuse Sales Already This Year Exceed 1922's

SYRACUSE, N. Y., Sept. 1—Automobile sales in this city for the first seven months of the year have exceeded the total sales for 1922, according to figures announced by the Syracuse Automobile Dealers' Association. Total sales so far this year of new cars amount to 6,631 compared with 5,325 for the entire year of 1922.

The automobile business here has exceeded the fondest expectations of dealers, who predict that when the year ends total sales will exceed \$6,500,000. These figures do not include approximately \$1,500,000 for used cars.

April has been the biggest month so far with 1484 passenger cars sold and 183 trucks. May was second with 1266 and 154 trucks. July is third with 992 cars and 145 trucks.

IN THE RETAIL FIELD

The Becker-Hoffman Service Co., Inc., of Buffalo, N. Y., has bought property at 133-35 Elmwood avenue, upon which to build a modern three story garage. The structure will be built of brick, at a cost of \$75,000.

Alterations having been completed, Joseph S. Donovan, Metropolitan Boston distributor for Studebaker, has taken over the big building at 109 Brookline avenue, formerly owned by the Willys-Overland Co., for an additional service station. He will continue his sales and used car departments on Commonwealth street, and also the two large buildings on Cummings street, now used as service stations also, which with the new addition gives him a total of 122,000 sq. ft.

W. T. Shea, Hartford, Conn., former service manager of the Marshall Motor Co., and for many years connected with the Cadillac service department in Boston, has formed a partnership with William Jones, proprietor of the Crown Garage, 27 Charter Oak Place. The firm is specializing on Velie and Cadillac service.

Gate City Motor Co., of Greensboro, N. C., is moving into its new home. The building is 116x200 feet, two stories. The company handles Studebaker cars.

Colonial Motor Company, Inc., of Charlotte, N. C., has been chartered for general automobile business. Authorized capital stock is \$100,000.

Manke Motor Co., Bloomfield, Neb., would like to get in communication with Hans A. Hagen, a shop mechanic, formerly employed by that company, who is believed to be somewhere in Iowa.

George M. Danforth, a farmer, has closed a deal with J. H. Schotzhauer and Frank Brickley of the Bunceton Auto Co., at Bunceton, Mo., to take over the Ford agency in that city. The new owner has selected a new site for the business and will erect a new building. The agency will be known as the Danforth Auto Agency.

Fray Johnson, who has been a bookkeeper in the First National Bank at West Plains, Mo., has gone to Ozark, Mo., where he will establish a Ford agency.

To facilitate the growing distribution of Paige and Jewett cars in the southwest a factory branch of the Paige-Detroit company has been established in Dallas, Tex. A complete stock of cars and parts is kept on hand to supply the Paige-Jewett dealers in Texas, Oklahoma, Louisiana and Arkansas. C. M. Welch is in charge of the factory branch now, M. R. Jewett is in charge of the sales in the district.

Frank Dillon and James Sunken, Wenona, Ill., have purchased the Wenona Garage from J. W. McGrath, who will conduct a motor car sales agency exclusively. The new owners were formerly employed as mechanics.

M. A. Jackson and son, V. E. Jackson, have purchased the Jerkins Garage at Beebe, Ark., and will operate a Ford agency and repair shop, under the name of the Jackson Motor Co. The firm plans to erect new buildings. Jackson and his son went to Beebe from Hampton, Ark., where they were engaged in the automobile business.

Leonard Stark has purchased the half interest of his partner, Holt Brett, in the Southwest Tire Co. at Third and Lyon streets in Carthage, Mo.

William Bilderbach will take over the Dubuque (Ia.) Velie agency and in association with H. R. Miller, experienced dealer now located at Maquoketa, Ia., but recently of Monmouth and Clinton, handle the Velie line. They have leased the garage recently vacated by Schrup Motor Company at Fourth and Main streets.

F. E. Maffett, Inc., of Atlanta, Dodge Brothers distributor in North Georgia, announces the appointment of Walter L. Dunn as manager of the new Maffett branch in West Atlanta. H. L. Burns, formerly in charge of the branch, has been named retail sales manager for the Maffett Company.

The Seggrebrich Chevrolet Co. has been organized at Chicago Heights, Ill., and has opened a garage and sales agency at 1646 Vincennes avenue. The promoters include Henry Seggrebrich, Carl Seggrebrich and Emil Stassen.

The A. W. Henneberger Co. has been organized at Kankakee, Ill., to handle motor cars, trucks and tractors. A garage and sales agency has been opened at 224 East Station street.

The Whitman-Floyd Motor Co., of Ensley, Ala., has secured the Chevrolet franchise for distribution in that vicinity in Alabama, and will establish show rooms and service station at Ensley. The new company takes over the Chevrolet agency that has been conducted at Ensley by J. C. Barrett.

R. O. Fleming, who has operated an independent garage at Jasper, Ala., for the past ten years, has taken the franchise for the distribution of Reo cars and trucks in that section of Alabama.

New automobile agencies formed the latter part of August in the southeast are as follows: Stegin's Motor Sales Co., Savannah, Ga., capital, \$20,000; King Motor Co., Burlington, N. C., capital, \$10,000; Southern Motor Service Co., Concord, N. C., capital, \$100,000; C. R. Sutton Auto Co., Greenville, N. C., capital, \$50,000; Cowpens Motor Co., Cowpens, S. C., capital, \$10,000.

The Lee-Simpson Co. has been organized and incorporated with \$20,000 capital at Jacksonville, Fla., to handle tires, accessories and automotive equipment.

One Ford dealer in Dallas, Tex., has carried his \$5 a week plan a little further than direct solicitation with great success. He made an arrangement with one of the leading department stores whereby that store gave the first \$5 payment free with a \$5 purchase in the store or \$5 payment on account. The business was so large that the Ford dealer had to station a man in the store for a week to take care of the "first payments" on automobiles.

J. E. Tyson, Peoria, Ill., has been appointed distributor for the Traffic Truck and will maintain a sales agency and service station at 2006 Main street.

Nelson Phyllis, Orion, Ill., has been appointed distributor for the Durant and Star cars and has opened a sales agency and garage in the Gustafson building, which has been extensively remodelled for the purpose.

The Plummer-Wolf Motor Sales Co. has been organized at La Grange, Ill. Capital stock has been fixed at \$5,000. The promoters are Walter Wolf and Reginald Plummer. A garage and sales agency will be opened at 405 Fifth avenue.

The Cochran Sales Co., Baltimore, distributor of the Rickenbacker and Duesenberg, is getting located in its new building, 113 West North avenue. The building is a most attractive one in every particular, affords much larger quarters and a large service station is directly in the rear of the showrooms.

The Elcar Motor Sales & Service Co., Gravois Road and Compton avenue, St. Louis, has obtained the agency for the Elcar.

Vesper-Buick Co. of St. Louis, announces the appointment of E. A. Dodge Motor Co. of Granite City, Ill., as Buick dealer in Granite City and the Tri-Cities. E. A. Dodge is president of the company and was formerly associated with the East Side Buick Co. The new firm is at 1926 State street, Granite City.

Wayne Murray, widely known automobile man, has purchased the interest of C. E. Swallow in the Morten-Swallow Motor Co. of Dallas, Tex., Maxwell-Chalmers dealer. Murray succeeds Swallow as manager of the company. Swallow has returned to the Hackson Street Garage.

The Poppenberg Motor Car Co. has been appointed as representative of the H. C. S. car in Buffalo and adjoining territory.

The Jones-Boyd Motors, Ltd., 531 Yonge street, Toronto, Canada, has been appointed Haynes dealer for that city, according to an announcement by Gilbert U. Radoye, director of sales and advertising for The Haynes Automobile Co. The members of this firm are L. W. Jones, Harry J. Boyd, and E. J. Hollinger. The new company has incorporated for \$50,000. A service station for Haynes cars exclusively will be maintained.

The Chicago Chevrolet Sales Co., of which H. A. Wehmeier is general manager, has changed its firm name to Community Motors, Inc., and will take on retail distribution of the Oakland through a number of community stores, discontinuing the Chevrolet line. Stores have been established at 6529 Cottage Grove avenue, 6626 South Halsted street, 914 Diversey Parkway, 5715 Broadway and 2554 Milwaukee avenue. General offices will be at 2633 Michigan avenue.

Moore & Elam have opened a new automobile agency at 303-5 S. Main street, Memphis, Tenn., and will handle the Chevrolet car, with complete salesroom and repair shop.

The Duesenberg Automobile Co. of California, with headquarters at 1930 Van Ness avenue, San Francisco, is announced as the new northern California distributor for the Duesenberg line of automobiles. Lloyd S. Johnson is president of the new company, which opened for business Sept. 1. With Johnson are B. T. Rocca, secretary, and Andrew Rocca, treasurer of the firm. Johnson formerly was sales manager for the previous Duesenberg distributor here. Oakland headquarters for the Duesenberg will be in charge of Norman E. Rotermund, of Rotermund and Drummeler, 3022 Broadway, where sales and service of these cars will be handled for Alameda county.

The Chester N. Weaver Company, distributor of Studebaker automobiles in San Francisco, has purchased from the Willys-Overland Branches, Inc., the property at the southwest corner of Van Ness and Bush streets, San Francisco, for

Automotive Industry Enjoys Great Expansion in South

Hundreds of New Retail and Maintenance Shops Mean Keener Competition for Trade

ATLANTA, Ga., Aug. 31—A definite idea of the remarkable development the automobile industry has experienced in the south this year is shown in a report received in Atlanta the latter part of August, and emanating from an authentic source.

The report shows that during the first seven months of this year, January to July inclusive, that there were 816 announcements made in the various southern states either of new automobile agency firms, garage companies, accessory dealers, or tire dealers established, or of new construction carried out by existing companies in this field. Of this total nearly one-half, or close to 400, are probably of new companies that have been formed in the various southern states as agencies for automobiles, dealers in the equipment field, or independent garage companies.

As compared with figures of the same kind for January to July inclusive, 1922, the present year's total is approximately double those of last year.

There was a slight falling off in July, when the total of such announcements was 106.

While this includes a majority of the new companies in all of the southern states, it does not include all of them as information is not available, and it is likely, therefore, that the entire total for the whole south would be close to 1,000, of which nearly 500 would be new companies in the automotive trade field. This report includes all of the states below the Mason and Dixon line.

AUTO-LITE EARNS \$7.25 A SHARE

TOLEDO, O., Sept. 1—Net earnings for the Electric Auto-Lite Co. for the first half of the year were announced here as \$1,813,095, equivalent to \$7.25 per share on 250,000 shares of no par common outstanding. During that period more than \$600,000 of outstanding bonds were retired. President Miniger said he expects to purchase and retire about \$400,000 more before Dec. 1. This would leave only \$1,000,000 outstanding at that time. During the first half year 350,000 starting and lighting systems were built as compared with 411,000 for the entire year of 1922. The last half of this year has 250,000 jobs scheduled.

\$450,000. The property, which has a frontage of 220 feet on Bush and 120 feet on Van Ness, will be the location of a new headquarters for the Weaver Company.

C. R. Sutton Auto Co., Inc., of Greensboro, N. C., has been chartered with an authorized capital stock of \$50,000. The corporation will take over the old Sutton Auto Co.

B. D. Heath Motor Co., Hudson and Essex dealer in Charlotte, N. C., has been allotted a number of additional counties and is now rated as distributor.

The READERS' CLEARING HOUSE

Questions & Answers on Dealers' Problems

The Rewinding Boss Was a Little Too Sure

Q—We recently had in our shop a generator which had a grounded armature and this condition seems to cause the cutout relay contacts to vibrate. We sent the armature away and had it rewound and now we find that the machine charges but gets very hot. We also find that at times it will heat up badly and at other times it seems to cool off while running. We have now sent the whole machine away to have this condition overcome and would appreciate any suggestions you may have as to the cause of this trouble.—Glendive Subscriber.

1—For a possible solution for this overheating trouble, we are indebted to an experience related by the director of the school of Automotive Electricity of Milwaukee.

A similar case was encountered in one of the Milwaukee service stations where an armature burnt out and was rewound. After being rewound it was found that the generator charged but that the machine heated up very badly. A test and inspection of the armature showed that the laminations of the armature core were shorted, due to the bearings having gone bad at some time which allowed the armature to rub on the pole pieces. The eddy currents thus produced in the armature core caused the overheating which was experienced.

The condition was explained to the service station which had rewound the armature and they claimed to be practical men and scorned the theory above described. The machine was put back into service and burnt up the next day. This made a somewhat deeper impression on the service station which had done the rewinding and they finally came to the conclusion that the analysis had been correct. A new armature and new winding corrected the trouble.

Other possible causes of overheating are excess output, due to improper setting of third brush in case machine is of this type, also improper location of main brushes which causes excessive arcing at the commutator. Another cause of overheating is a poor connection between the generator or battery or even inside the generator between the live brush and the terminal. We know of one case where a slight looseness of the nuts on the terminal studs caused overheating of the generator. When an attempt was made to tighten up these nuts the whole stud turned so that the connection could not be made any tighter.

However, this was taken care of by sawing a slot in the top of the screw so that a screw driver could hold the stud while a wrench was used to tighten up the stud. This overcame a condition of heating due to poor connection inside the

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

generator. Poor connections can easily be located by means of a voltmeter for a voltage drop is always present where current flows through an appreciable resistance.

LUBRICATION OF KNIGHT ENGINE

Q—Please answer the following questions relative to a Willys-Knight model 84PLH-engine No. 84 4482. 1—Give route of oil circulation.

1—The engine lubrication system on the model 84PLH Willys-Knight is of the force feed type. The amount of oil necessary for the oil indicator to register "full" is seven quarts. The oil is circulated by an oscillating plunger pump, located back of the center rib of the cylinder block. The plunger of the pump is connected to, and operated by, the eccentric shaft.

The lubricant is drawn from the oil base through a fine mesh screen and forced through it direct to the three main bearings. From the main bearings it is forced through holes in the crankshaft

to the connecting rod bearings. A branch of the oil distributor pipe, which takes the oil to the main bearings, is also connected to the bearings of the eccentric shaft and from the front main bearings to the chains and sprockets which take the place of timing gears.

The flow of oil is regulated automatically, with the gasoline, by a valve just in front of the oil pump which connects it to the gasoline throttle lever. Opening the throttle opens the oil valve so that as the engine speed increases a greater amount of oil is sent to the bearings. Proper working of the system is indicated by a pressure gage located upon the instrument board.

There is no given amount of pressure in pounds that should be shown on the gage. Owing to the fact that the pump is a plunger type there will be a consistent vibration or moving back and forth of the gage hand instead of a steady registration.

2—What length of spark plug is recommended?

2—The spark plug for the Willys-Knight should be a $\frac{7}{8}$ by 18 "extension." This means that the plug is a little longer than the regular.

3—What is size of radiator hose?

3—This information is not available.

4—What year was this machine made?

4—Model 84 was produced in 1916.

5—What is the size of the tires?

5—34x4.

6—What is the gear ratio and how many teeth on ring and pinion gear originally intended for this touring car?

6—The gear ratio is 4 to 1 but the number of teeth is not known. It would probably be 12 to 48, 13 to 52, 14 to 56 or 15 to 60.

7—This machine has a magneto which has no contact control arm on the breaker case for advance or retard of spark, although there is a spark lever on quadrant on steering wheel and control rods provided. A breaker case with two cams and control arm was found under seat. Should this be put on the magneto as it seems to fit O. K.?

7—Yes.

8—What kind of magneto was originally on this engine as the final control connection is at the rear or gear end of present magneto?

8—The original equipment was a Splitdorf Dixie magneto.

9—Carburetor is a Tillotson. How many turns should the needle valve adjusting pin be opened ordinarily?

9—1½ to 2 turns.

10—What horsepower rating is given this engine?—Edwards Garage, Kennard, O.

10—The S. A. E horsepower rating is 27.23, while the actual horsepower is in the neighborhood of 50.

Shop Activity Seen Through Windows in This Service Station

Q—We are grading a place for a building 50x100 ft. We have plenty of ground for a larger building, but we think it is big enough to start with, as Spruce Pine is only a small place. We wish to do repair work, have a place for storage, salesroom, a room for auto supplies and a small machine shop and a waiting room.

If you have any plans for a building of this sort we would appreciate you sending them to us.—H. K. Hemphill, Spruce Pine, N. C.

Your layout is quite unusual, in that it faces the main road the longest way of the building, but at the same time for this reason it is perhaps much easier to make a good layout.

We have placed the car showroom in the corner of the building near the bend in the road so that it is visible down this road to some extent. The repair shop, of course, will have to be at the other end and the garage in the center. With the extensive frontage it will be very easy to get a small accessory store in where it will be very accessible to passing tourists. The frontage will also allow a battery and tire shop which will also be very accessible.

We would recommend that instead of placing your building 13 ft. from the road, you move it back 22 or 23 feet, thus allowing space for two driveways, one in each direction, facing your gasoline pump, which, no doubt, you are planning to have in front of the accessory store.

The roof should be supported on five trusses and in spite of the fact that windows may be put in all the outside walls, we suggest that two skylights be installed in order to give the back and center of the building more light. Of course, the rear part of the building will be of little use on account of the high bank.

THIS ELECTRICIAN ADMITS A JOKE ON HIMSELF COME ON, FELLOWS, FESS UP

Q—We recently had a case of starter trouble where the joke seemed to be on us. The car was a Hupmobile of about 1915 to 1917 and the owner requested that we supply the best battery available for his car. When the battery was installed it was found that the starter would not turn the engine over but this was more or less to be expected as the starter had not been used for a year previous and was very dirty.

The starter was then overhauled, tested and found O. K., but when put on the car would only turn the engine over slowly. Trouble was at first attributed to the battery as it was thought it had not yet attained full capacity. Test on the battery showed 225 to 250 amperes flowing with a voltage of 4.4 while the starter switch was held down. Bearings were O. K., there were no shorts or grounds and armature was not rubbing the pole pieces. The wiring was checked and found to be O. K. and as the battery was new we thought it was quite a puzzling case.

We then decided to go over everything again and finally found that two brushes out of four were not touching the commutator due to the fact that the brush springs were wedged on the side of the brushes so as to hold them from the com-

Architectural Service

IN giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things,

we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

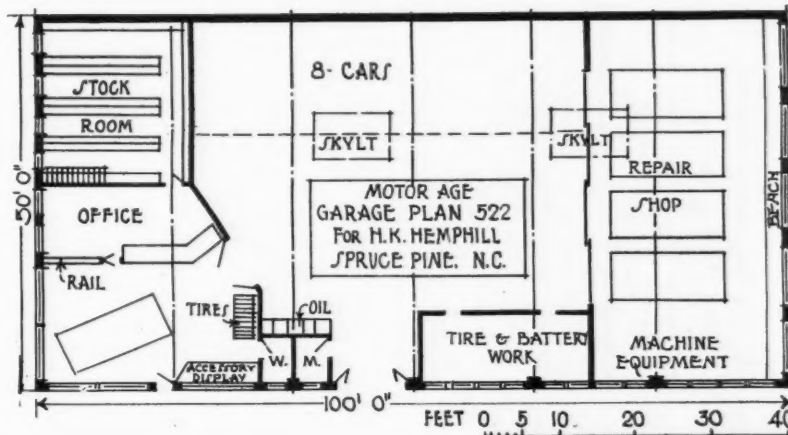
What departments are to be operated and how large it is expected to be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.



mutator. With all four brushes touching the commutator the operation of the starter was normal.—C. E. Streed, New Rockford, N. D.

MOTOR AGE frequently gets questions and the subscribers request that their name be not published in our paper. The thought apparently is that other repair men in their town would get next to the fact that they were asking for help and might make fun of them. It is accordingly refreshing to get a letter such as the one above printed where the writer admits that he is human and can appreciate a joke even when it is on himself. We especially appreciate this attitude as occasionally a subscriber gets one on us and when this happens we are glad to admit it.

Perhaps if our readers appreciated the fact that MOTOR AGE does not go to their customers and that no car owner subscriptions are accepted they would feel more free to discuss their problems and have us print their names. Their fellow dealers and electricians are the only ones who are at all likely to see the information that is so published and by exchanging experiences we all benefit.

FORD LIGHTS DIM WHEN THEY'RE BRIGHT

Q—I have a 1921 model Ford which burned completely down in a fire some weeks ago. I have since rebuilt it, among other things have put on a new storage battery, and complete new wiring system, switch, ammeter, generator cutout, etc., and all other electrical parts. However, the lights are not as bright as they should be, even when battery is at full charge. I have new reflectors and bulbs, of two filament type, 21-4 c.p. Can you throw any light on the subject?—S. F. Bailey, Madisonville, Ky.

The indications judging from your letter are a loose connection or a high resistance somewhere between the battery and the headlamp bulb. To test for this condition use a voltmeter and test at

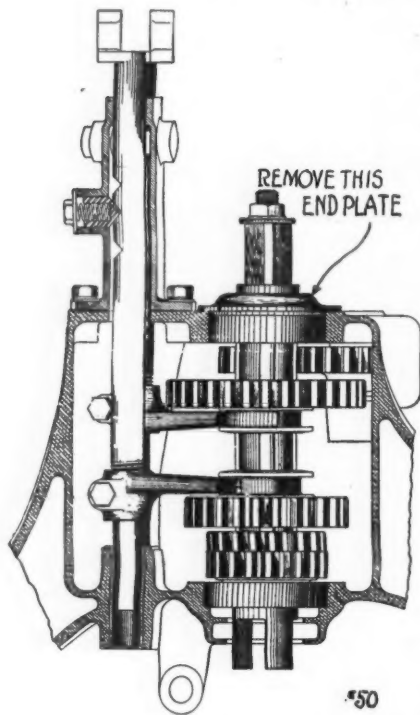
the battery terminals. This on a normal battery will be in the neighborhood of 6 or 6.5 volts. Then with the switch turned to the dim position put one lead of the voltmeter on the live wire at the back of the head lamp and put the other end on the frame of the car.

If the voltage shown at this point does not vary more than .2 of a volt from the voltage which you secured when you made the test at the battery it indicates that the wiring from the battery to the lamps is O. K. Test of the lamps in the bright position can be made in exactly the same manner with exception that the meter lead is placed on the other wire at the back of the head lamp.

Do the same with each lamp and if all the connections test O. K., that is with no appreciable variation in voltage as compared to the battery voltage, it would indicate positively that the lamps were at fault. The only remedy in that case is to try a different bulb. If the voltage shows a variation of more than .2 of a volt you should examine the wiring between the battery and the lamps and as a ready method of finding where the loose connection or high resistance is located you may use the voltmeter and test from the lamps, working towards the battery until you have found the point where the drop in voltage occurs.

We have with us today our old friend, Bill Fixit. If there is anything you would like to know about ignition coils or distributors you will probably find it in his talk at the shop conference, which we reproduce on page 19.

Replacing Gears in 1912 Hudson Transmission



Q—Will you supply instructions for putting in the high and intermediate sliding gear on a 1912 model 33 Hudson touring car? Is it necessary to take out the engine?—The Central Garage, Kerrobert, Sask., Can.

1—To remove the Hudson transmission assembly disconnect the rear universal joints completely and drop the drive-shafts. Then unbolt the transmission arms where they fasten to the engine at the rear end of the engine crankcase. After disconnecting the various brake rods, parts and gear shifting mechanism, the case can be withdrawn. When you

have the transmission removed from the chassis take off the cover of the case and drain the lubricant.

The main shaft is removed by loosening the capscrews that hold the main shaft rear bearing end plate to the case. This end plate is indicated at the arrow in the illustration. With this loosened and the felt washer at the opposite end of the shaft free of the shaft, the shaft proper can be withdrawn to the rear which will leave the sliding gears resting on the shifter forks.

If you then wish to remove the gears it will be necessary to loosen the gear-shift locking plungers. These are also shown in the illustration and are the pointed pieces which engage the vee shaped slots in the gear shift lever. Removal of these will permit of turning the gearshift shaft up so that the rod yokes or forks will permit removal of the gears.

NOISY ENGINE CAUSED BY CAMS WEARING UNEVENLY

Q—Would appreciate information in regard to quieting Jewett valves. In a few cases we renewed the brackets and push rods, also adjusted screws and nuts without obtaining any appreciable benefit. We have come to the conclusion that the trouble lies in the camshafts.—Pennsylvania Subscriber.

1—It is possible, as you suggest, that the trouble is in the camshaft, although it may also be in the camshaft bearings, which may be loose enough to give erratic operation. These you can check by inspection.

Trouble in the camshaft itself might be due to uneven wear on the heel of the cams. You can check this by turning the engine over until any valve rises from its seat and then goes down again. At this point you can check the clearance between the valve stem and push rods with a thickness gauge and see if it

varies as the crank is turned farther. If there is any great variation it shows unevenness on the heel of the cams, which may account for the noise you are experiencing.

It is also possible that you have uneven clearances between the valve stems and push rods. The clearance should be .005 inches.

WHY REGRIND AFTER ONLY 1,700 MILES DRIVING?

Q—I have a Studebaker light six that has run about 1,700 miles. Would you advise putting in non-score aluminum or aluminite pistons or would you advise putting in the regular piston and having the motor block reground?—Ben Engels, Sheldon, Iowa.

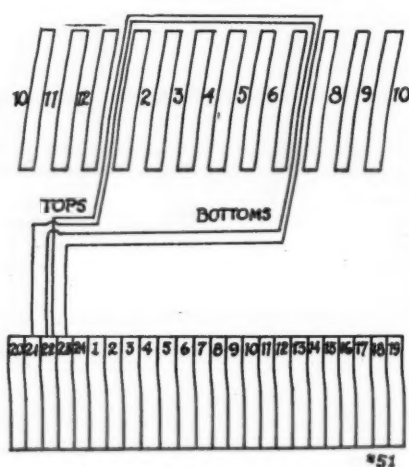
We never heard of a car needing regrinding of the cylinders at the mileage you mention and even if it was 17,000 instead of 1,700 we would think that the service had not been very satisfactory, as a good car should give 25,000 miles at least before regrinding should be required.

You do not state why you wish to regrind the cylinders, whether you have piston slaps or whether the engine is pumping oil and we would suggest that you get in touch with some concern capable of making a careful analysis of the condition of the engine.

If the cylinders are worn oversize so that the engine pumps oil and has poor compression or if the cylinders are more than .003 inches out of round it may be advisable to regrind and install new pistons. However, it is contrary to the policy of MOTOR AGE to recommend any particular type.

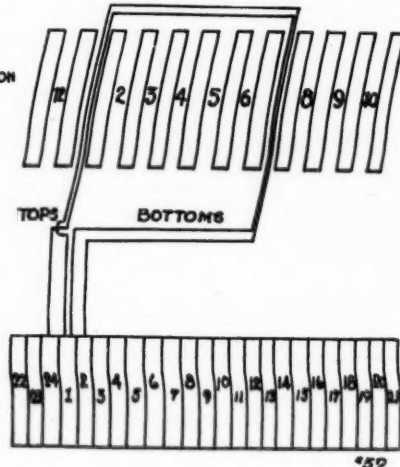
We believe that the best thing you could do would be to get in touch with some reliable shop where they do cylinder grinding and let them check up the job for you, and advise what needs to be done.

Autolite Generator Armature Winding Diagrams



GENERATOR
MAKE AUTO LITE
TYPE G.G. RIGHT HAND ROTATION
SLOTS 12
SEGMENTS 24
COIL PITCH 1 & 7
COILS PER SLOT 2
TURNS PER COIL 9
WIRE SIZE #17
WIRE INSUL. S.C.E.
COMM. CONN. 1 & 2 L
TOP LEADS 4, 5 L & S
BOTT LEADS 3, 4 L & S
POLES 2
VOLTS 6
WINDING 1, 2, 3, ETC.

USED ON CARS,
CHEVROLET 1920



GENERATOR
MAKE AUTO LITE
TYPE G.H. RIGHT HAND ROTATION
SLOTS 12
SEGMENTS 24
COIL PITCH 1 & 7
COILS PER SLOT 2
TURNS PER COIL 11
WIRE SIZE #18
WIRE INSUL. D.C.C.
COMM. CONN. 1 & 2 L
TOP LEADS 1 & 2 L & S
BOTT LEADS 1 & 2 R & S
POLES 2
VOLTS 6
WINDING 1, 2, 3, ETC.

USED ON CARS
KING 1921-22

Q—Send me wiring diagram for Auto-Lite G. J. generator.

1—Wiring diagram for the G. J. Generator is not available.

2—Where can a complete volume be se-

cured on armature winding?

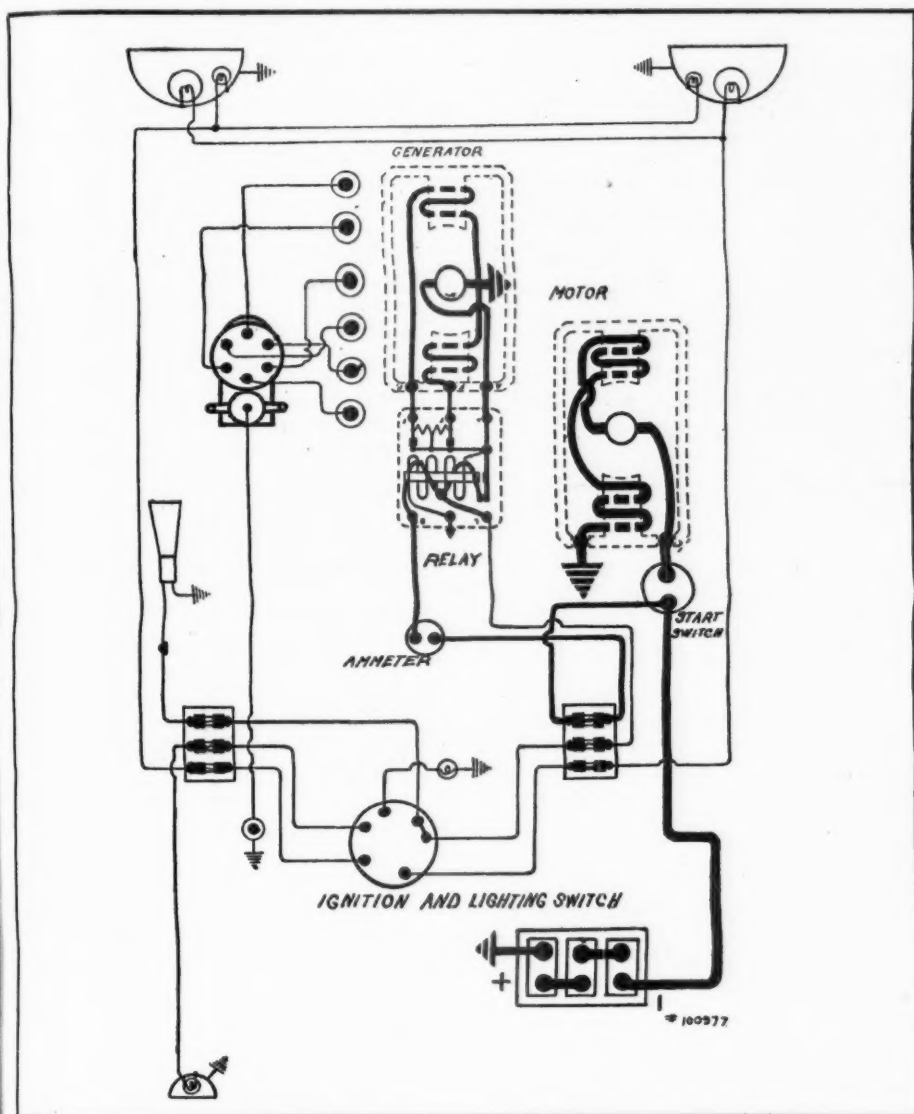
2—The name of the firm supplying wiring diagram for armatures will be supplied by separate letter.

3—If the wiring isn't the same for the

G. H. and G. G. Auto-Lite give them also.—Michigan Subscriber.

3—The armature winding diagrams for the G. G. and G. H. model Auto-Lite generators are shown as requested.

Wiring of Model 16 Chandler



Q—Publish wiring diagram of a model 16 Chandler 6 touring car. Also wiring diagram for the generator.—Valley Garage,

Therma, N. M.

1—Diagram desired is shown.

THE RIGHT SPARK ADVANCE DETERMINED BY EXPERIMENT

Q—Is there some rule to calculate the extreme advance on the average motor. Some motors coming out now have no stop on the ignition head and I find some of the levers are not the right length, and at full advance the spark lever is too far advanced.

There is no hard and fast rule to calculate the maximum advance allowable on an ignition system, on the average engine. The best point of ignition is secured only by experiment. Regardless of the engine it is advisable to set the ignition in the retard position, so that the points just open when the piston is at the upper dead center firing stroke. If, when the piston is set in this position in retard, the advance position of the quadrant allows too much spark advance you can adjust the rod or advancing mechanism so that this point cannot be reached.

In other words the advancing mechanism should be so adjusted that it will

have no available movement after a certain advance has been reached. Generally speaking the amount of advance that an engine will safely stand is a product of the speed in revolutions of the engine. Generally speaking engines of extremely high speed have considerably more range of advance to the spark as the higher the speed the more advance is possible.

Regardless of the characteristics of the engine it should not be possible to advance the spark to a point where the engine will show signs of bumping or spark knock. The human element enters largely into this as it is possible on any engine to secure spark knock if the spark is not advanced intelligently. Too much advance at a slow engine speed or under a heavy load will cause a spark knock.

2—How many inches on the flywheel, at extreme advance, should the spark be set?

2—The amount of distance on the flywheel representing advance in the ignition will vary according to the diameter

of the flywheel. Translated into fractions of an inch of piston travel the average engine will have not more than $\frac{3}{4}$ of an inch advance. That is, the spark at full advance will occur about $\frac{3}{4}$ of an inch before upper center with the spark fully advanced. This of course does not apply to racing engines of 4000 to 5000 r.p.m.

3—How were the super-chargers on the late racing cars constructed and how did they function?—Louis Perkins, St. Paul, Minn.

3—A description of the Mercedes super-charger used on the Mercedes racing cars campaigned at Indianapolis in 1923 was printed in the issue of Motor AGE which was published immediately after the race. The date of publication of this description was June 7th, 1923.

BALANCE REQUIRES PROPER ASSEMBLY OF FLYWHEEL ON CAMSHAFT

Q—Would like to know if it would throw a Buick six out of balance if the flywheel was put on so that the D. C. mark for one and six was not in the right place? How are the flywheel and crankshaft balanced, together or separately? Will the answer to these questions apply to most cars?—Clyde Powell, Sanger, Calif.

1—We have been informed by the local Buick establishment that the flywheel and crankshaft on the 1923-24 models of the Buick are balanced together, which means that any moving of the flywheel from its proper position on the crankshaft flange will throw the engine out of balance. In all cars sold previously by the Buick company they are not certain whether the shaft and flywheel were balanced separately or together.

On every Buick engine it is always advisable to make sure that the flywheel is properly installed as regards position on the crankshaft flange. We are not certain whether the crankshaft and flywheel of the other cars are balanced separately but would advise that you assume that they are balanced together, and that you will therefore, always bear in mind that the flywheels should be installed so that the valve timing marks correspond with the crankshaft position.

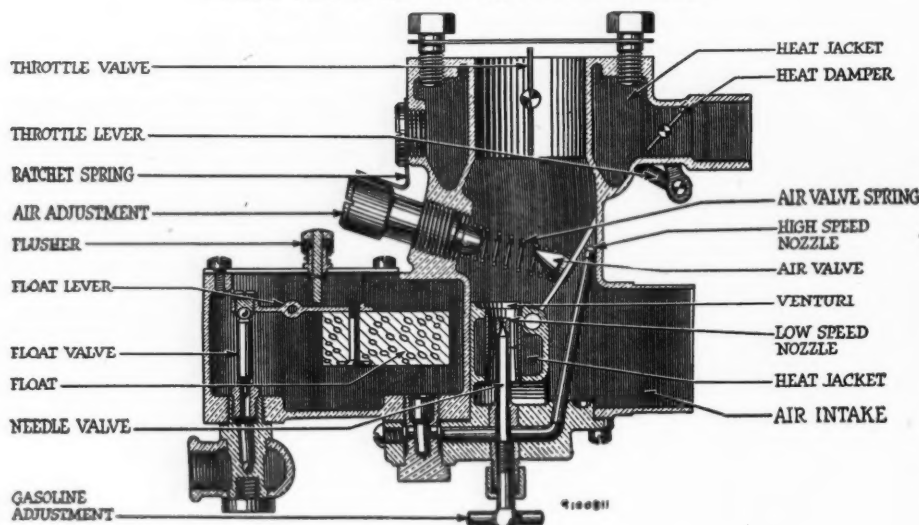
USE OF GENUINE HOSE WOULD HAVE PREVENTED TROUBLE FROM OVERHEATING

Q—In your issue of July 26, 1923, a story was told of a water pump hose collapsing on a Buick six. While we believe this illustrated certain engineering principles we think it should also be stated in answering this question that the mechanic should have used a hose sold by authorized Buick service stations. This hose has a wire inside it to prevent the hose closing at high speed.

We often have the user of a car say, "I will go somewhere else and get one for ten cents". They do not really know what the result will be, for Buick engineers know the strength of the pump and should be given credit for requiring their dealers to sell the proper hose connection which will give no trouble.—B. H. Murphy, Missoula, Mont.

The above letter speaks for itself. Perhaps some of our other troubles would be eliminated if we always used the right material.

Marvel Carbureter on Buick



Q—I have a Buick 6-model D45 which we cannot get to hit. This car idles well but seems to miss on road or will not pick up when throttle is opened. How many adjustments has it and how do you go about adjusting them?

1—The various adjustments on the Buick carbureter are marked in the figure. To adjust the carbureter proceed as follows:

Turn gasoline adjustment to the right until the needle valve is completely closed.

Shut air adjusting screw so that end of screw is even with point of the ratchet spring just above it.

Open gasoline adjustment by giving needle valve one full turn.

Start engine as usually, allowing it to run a few minutes with air regulator turned to hot until motor is fairly warmed up.

With the spark lever fully retarded turn gasoline adjustment to the right closing needle valve until engine idles smoothly.

Then advance the spark lever and turn air adjustment screw to the left a little at a time until the engine begins to slow down or skip, indicating too much air; then turn it to the right until the engine runs smoothly.

To test the adjustment leave spark lever advanced and open throttle lever quickly. The engine should accelerate instantly. If it skips or pops back open gasoline adjustment slightly by turning needle valve to the left. Do not touch air adjustment again unless it appears absolutely necessary. The best possible adjustment has been secured when the gasoline adjustment has been turned as far as possible to the right and air adjustment is turned as far as possible to the left, letting engine idle smoothly and accelerate quickly when throttle is opened.

2—How do you time ignition and at what point should the breaker points be set?

2—With the number one cylinder on the firing stroke at the top dead center position the spark should be set so that the points are just breaking with the

spark control lever in fully retard position. The interrupter points should have a gap of .018 of an inch when they are fully opened.

3—What is the valve timing?

3—The exhaust valve on the D45 Buick should close 10 degrees after upper dead center. Measured in piston travel this means about $\frac{1}{2}$ of an inch movement of the piston after upper dead center position.

4—Will a weak coil make car act in this way and how can I test coil to know that it is O. K.?

4—About the easiest way to test this coil is to have it in place on the car and connect it up normally. Turning on the ignition switch carries battery current not only to the ignition coil but also to the motor generator, field and armature. If the small wires on the motor generator, that is the field and armature connections, are disconnected, then turning on the ignition switch will give current to the ignition coil only.

You can now take off the distributor cap and disconnect the center wire, which leads from the ignition coil, to the distributor cap. This is a high tension wire and the end of it should be held within $\frac{1}{8}$ or $\frac{1}{4}$ in. of the engine or frame of the car.

You can now turn on the ignition switch and with the high tension wire forming a spark gap you can operate the interrupter contacts by hand, opening and closing them with one finger or a pencil. If the spark will jump $\frac{1}{8}$ of an in. every time the contact is broken the coil is probably O. K., but if the spark will jump only $\frac{1}{2}$ in. or so, it shows the coil to be defective.

About the only other possible cause of trouble would be a burnt condition in the interrupter contacts where the surface material is pitted deeply and where tungsten has been burnt away so that the iron itself is making contact.

Another possibility is that the distributor camshaft is worn in its bearings. If there is more than .006 or .007 looseness of this shaft in its upper bearings, it will vary the amount of opening at the

points and will give rise to missing at different speeds.

5—Give best way to remove valve cages to grind valves.

5—For all operations on this car we would refer you to the instruction book as the first source of information.

The regular method, where no special cage tool is available, is to use a rawhide mallet. After the cage nuts have been removed and the cage brass gaskets, use a rawhide hammer to tap on the end of the valve stems. This will cause the valve to move downward and when it returns on rebound it will tend to loosen the cage. The names of firms who supply a special tool for removing the valve cages will be supplied by letter. Northeast Generator on Dodge

Cuts Out Too Soon

6—Have a Northeast generator on Dodge which will charge to 15 or 20 miles per hour and quits. Have installed new brushes but still acts the same way. How can this be remedied? Is there any way of getting inside this generator without removing it from the car?—The Marrowbone Garage, Marrowbone, Ky.

6—The nature of the trouble appears to be in either a loose connection, an intermittent short in the armature, or due to an eccentric commutator. If you have the generator on the car we would suggest that you run it up to the speed where it cuts out, and with the commutator cover removed, apply pressure with the fingers to the three brushes. If this seems to correct the trouble up to a somewhat higher speed, there is no doubt, that an eccentric commutator is to blame. If so you should carefully center the armature with respect to the bearings and then turn the commutator.

It is recommended that this large armature be turned on its own bearings which is, no doubt, ideal from a theoretical standpoint but somewhat difficult from the machinist standpoint. If the generator is on the car, you might also connect a voltmeter from the live terminal to the frame of the car and observe what voltage you get when the generator stops charging at 10 miles per hour or 15 or at whatever speed it cuts out. If the voltage would suddenly jump up, it would show that the trouble was not in the generator but due perhaps, to vibration breaking a circuit in the cutout which is combined with the starting switch on the toeboard. On the other hand, if the voltage would suddenly drop as the generator cuts out it would show the fault to be in the generator itself.

Another possibility is that some of the leads were poorly soldered and this can be determined by pulling on all of them to see if they come out of their terminals.

Still another possibility is that there is a short in the armature which only shows up when centrifugal force puts a strain on the armature conductor. To test for this the field fuse should be removed and a voltmeter connected from the main terminal to the frame of the car. It will read the voltage generated on residual magnetism which should increase in proportion to the speed of the engine. If, as the engine speed is in-

Continued on Next Page

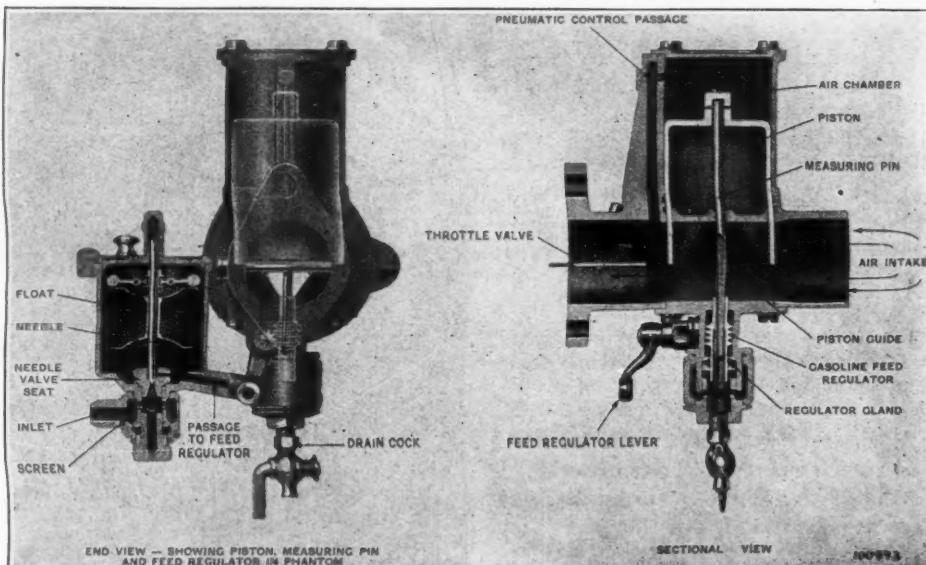
Operation of Carbureter on Hudson

Q—We have a 1917 Hudson Super Six car which has a habit of heating up considerably after even a short run and we are unable to find the trouble. We have checked up the following points. The car has plenty of water, with no leaks in the cooling system. The car has plenty of oil in the crankcase, the fanbelt is tight and the carbon has been removed. The impeller is tight on the water pump shaft.

The car has plenty of power on runs, which we think proves that the timing is O. K. Sometimes the engine backfires on grades and sometimes starts a little hard. Is the trouble in the carbureter and if so how can it be remedied, as there is no adjustment on the Hudson carbureter?—R. E. Smith, Hamilton, Ohio.

An illustration is given of the Hudson carbureter and there is one possible condition which would cause a lean mixture and this would tend to make the engine run hot. In the right hand view in the illustration air goes through the carbureter from right to left and in doing so creates a suction which lifts the piston in the upper portion of the carbureter.

This in turn operates the needle valve in the gasoline feed regulator and allows more gasoline to go into the mixture at high speeds. It is possible that dust and dirt in the intake has caused the piston to stick, so that at high speed the mixture is much too lean. You can check this condition by taking off the cover at the top of the carbureter and lifting the piston out by hand. It should slide easily and if it tends to stick should be washed off carefully with gasoline.



When replacing the piston a few drops of kerosene on top will help flush down any sediment or grit which the gasoline may have left. The fact that the engine sometimes backfires would seem to indicate possible trouble in the carbureter as you suggest.

While you state that the impeller is tight on the shaft we would suggest your watching the flow of water by removing the radiator cap and observing the action while the engine is operated at various speeds. We have heard of cases on other cars where an old hose would collapse at high speed thereby cutting down the flow of water.

While you state that the car has plenty of power and accelerates well it might do no harm to check up the ignition timing and see that in the retard position the spark occurs when the piston is on upper dead center. Another possibility is that the automatic spark advance is stuck and does not advance the spark at high speed.

Still another possibility is that the radiator is clogged up or coated with lime on the inside so that it does not have its original cooling efficiency. About the only way to check this is to try a radiator from a car known to be working satisfactorily.

Continued from Preceding Page

creased, the voltage goes up for a while and then suddenly drops off or wavers, it shows the trouble to be either in the armature or brushes, and if holding the brushes firmly on the commutator does not correct the wavering condition of the voltmeter needle a new armature should be tried, if possible.

Would also suggest that you look for a loose fuse connection and would suggest sandpapering the end of the fuse, also the clips to which it makes contact. The data here applies to the model G North-east generator.

KNOCK AT 25 M.P.H. DUE TO MAIN BEARINGS

Q—We are having trouble with several E-45 Buicks, they develop a knock when going between 25 and 30 m.p.h. The bearings and piston pins are in good condition. Would be glad to get some information on same from you as soon as possible.—The Tremont Garage, Tremont, Ill.

A knock in a Buick Six that occurs between 25 and 30 m.p.h. is usually indicative of loose main bearings. The front bearing seems addicted to looseness more than the others on this engine and we would advise that you pay special attention to this front one when checking the main bearings. It would also pay to give a second look at the connecting rod bearings.

Quite often bearings are tightened by filing the bearing cap. Unless the cap is

filed to a true surface and an equal amount removed from each side it will have an uneven contact on the shaft when it is drawn up tight. This uneven contact usually is concentrated on a very small area of the babbitt bushing with the result that when the engine is first turned over all bearings seem tight but in a short time the small contact area is worn down and the bearing is loose. With this in view we would advise that you remove main bearing and connecting rod caps and check them for contact.

Another possibility is that the timing gears are worn. From information that we have received from a local service station it seems that the timing gears in the Buick 6 cylinder engine have a certain period at about 25 or 30 m.p.h. when they make their loudest noise if worn. The remedy for worn gears of course is to install new gears.

CORRECTION ON REMOVING COMBUSTION CHAMBER OLD CADILLAC

On page 49 of the May 24 issue of MOTOR AGE explanation was given of the manner in which the combustion chambers of Cadillac four-cylinder engines should be removed from the cylinders. The article in question stated that the combustion chambers are held to the cylinders by a hollow bolt incorporating a nut and head. We have been informed by the Cadillac manager, E. C. Garland, that this is wrong and we have since

checked up by seeing one of the actual cylinders.

What we should have said is this. The combustion chambers are held to the cylinders by a bushing having a right and left hand thread. The construction in principle is similar to a turn buckle and to remove the combustion chamber it is only necessary to make a suitable tool to fit the inside of the bushing between the combustion chamber and the cylinder and to unscrew the bushing. It is not necessary to hold the top of the bushing as was indicated in the first article. A steel bushing is used and the hexagon bar of the correct size to fit the inside of the bushing is the only tool required.

CORRECTION ON YELLOW CAB EQUIPMENT

In your issue of August 9th, page 44, we notice that in answer to a question about the equipment of Yellow cabs that you advise the inquirer that the Yellow cab has no generator. For your information the North East generator type 3847 is used as optional equipment on Yellow cabs and there are a number of these already in service.—North East Electric Co., Rochester, N. Y.

We appreciate having this correction from the North East Electric Co., although the information originally printed in the August 9th issue was obtained directly from the Yellow Cab Mfg. Company, and in giving this to us they doubtless neglected to mention that when specified the North East generator was obtainable.

GETTING MORE OUT of the SHOP

THE shop of the ambitious transportation merchant this winter will be as busy as it has been all summer. With the introduction of a number of the new models of cars, comes again the demand of the public for the closed vehicle. Automotive transportation this winter will be at the highest point in history. Already makers of cold weather driving fitments for the car have launched their campaigns and the effect of this propaganda can already be felt.

Besides, the car owner has, this summer, come to know his car better than ever before and he realizes what the winter will be without it. Be sure that every new buyer and owners of cars for a year or more, are giving the proper information as to lubrication for the winter.

A letter from you with all of the "dope" that they will need, will bring you many returns later on.

Fordex Rubber Stamps are announced by the Sales Equipment Co., 5981 Woodward avenue, Detroit. These rubber stamps are designed to aid sales literature, each one giving some illustration and slogan adapted to the sale of Ford products.

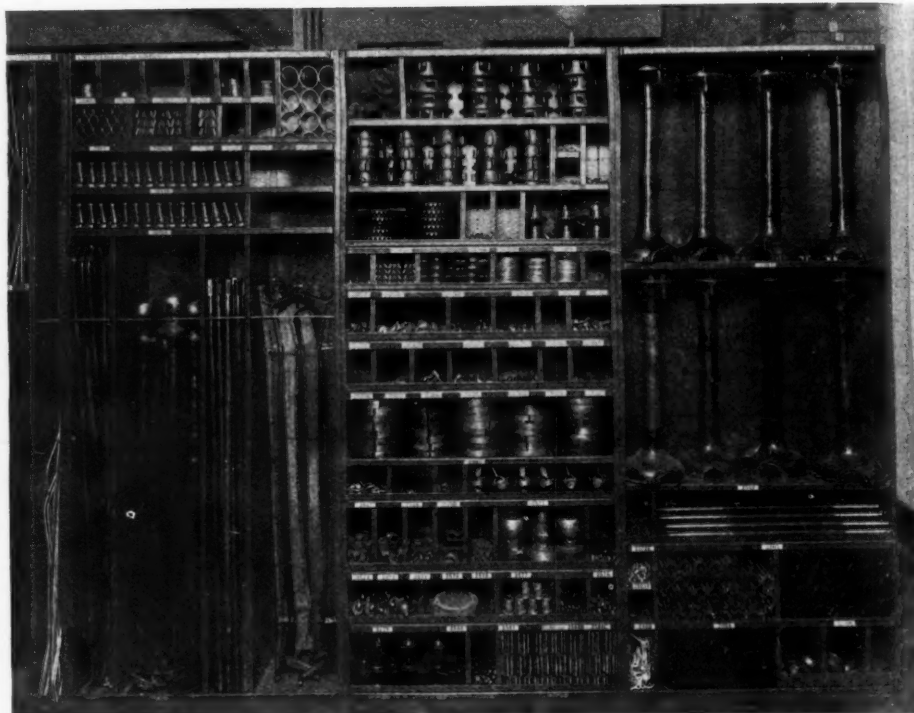
Bunting piston pin and spring bolt bushings for replacement in all automotive vehicles are now packaged in strong cartons of corrugated fibre board. The cartons contain 24 bushings in most instances. Some of the large bushings are packed 8 and 12 to the carton.

The new Bunting carton features an attractive label in colors and makes attractive shelf stock. The carton makes a perfect shipping container; its strength far exceeds transportation requirements. Bunting Brass & Bronze Co., Toledo, O.

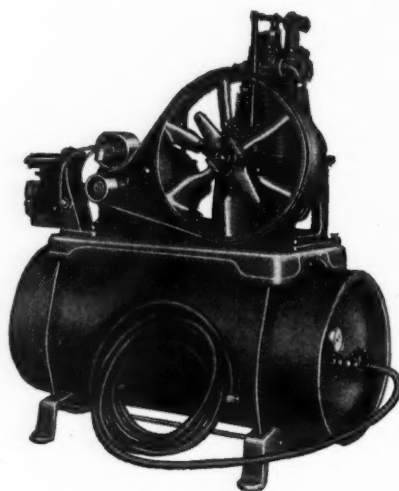
The Lyon Metallic Mfg. Co., Aurora, Ill., announces the F-25 Unit for Ford parts storage, shown in the cut on this page. The parts are stored in parts book order and numbers on each bin, correspond to the number in the book. The whole F-25 System provides storage space, with ample room for surplus, for approximately \$25,000 worth of Ford parts.

The new line of Curtis single and two-stage compressors has many improvements in design. A new type of belt tightener, which is self-adjusting, self-oiling and accommodates itself to variable loose and tight conditions of the belt automatically without the use of springs, permits shorter belt centers and consequently a more compact mounting of the compressor and motor. A smaller and lighter weight base is used, mounted symmetrically on the tank, which is the same capacity as was previously used but being larger in diameter and shorter, requires less floor space.

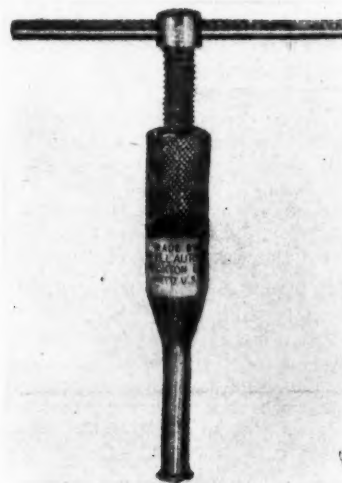
Seamless copper tubing is used between the compressor and tank instead of the



Lyon Ford parts storage



Curtis compressor



Campbell bearing extractor

usual wrought iron discharge pipe, eliminating several pipe fittings and thereby giving less chance for leaks and, since the connection is made to the tank between the compressor and motor, it is in a more protected position. Long sweep bends insure less friction than in the unavoidable sharp angles of an iron pipe assembly.

All compressors both single and two-stage have a completely enclosed crankcase, keeping out dust and foreign matter, and a vacuum breather valve which assures no oil on external surfaces of the machine.

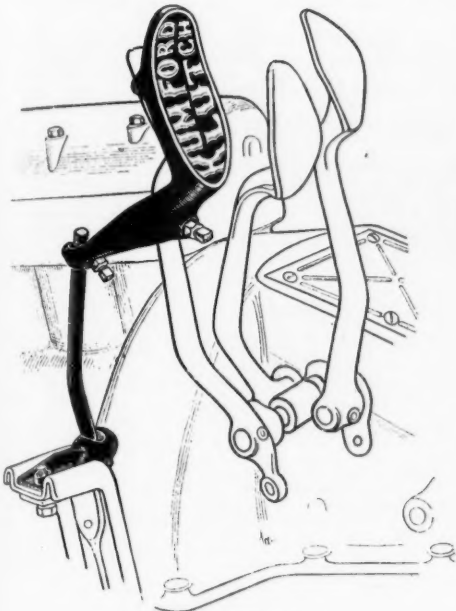
A new and improved type of high and low level oil filling gage, which also acts

as an overflow and prevents too much oil being put into the compressor, is another feature of the new outfits.

The mounting of the gage and outlet cock is now in the concave end of the tank, thereby being protected and not easily subject to injury. Curtis Pneumatic Machinery Company of St. Louis.

The Campbell Auto Works, 232 N. El Dorado street, Stockton, Calif. has placed on the market the Ford Generator and Starter Bearing Extractor, designed for the purpose of removing the small ball bearing from the commutator end of generator and the small solid bearing from the end of starter. The price of this tool is \$7.50.

BOOSTING ACCESSORY SALES



Kumford Klutch



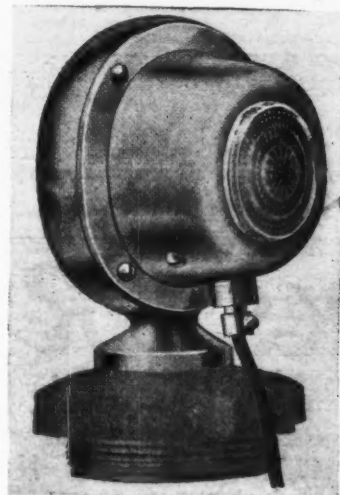
Weed Sentry bumper



Ideal reserve valve



Tiffany parking lamp



Acme-Lite

NOT long ago, we talked to an automobile dealer who remarked that his accessory sales have more than once saved him a little embarrassment. When asked what he meant, he replied, "Well, a few years ago, about this time of the year, it was customary for many dealers to begin to look around for something to do, so that we might live for the winter. I decided that there was plenty to be done, right in my own place of business that would keep me there and keep me busy. One particularly bad winter season saw several of my competitors drop out because of no business. I managed to pull through and when spring came with its rush, I purchased the accessory case you see outside there, and set in a supply of accessories that would meet every demand. All that year, I worked for more driving in winter and as the cold weather approached, I put on a strong campaign, sending men to all of the car owners in the community and urging them to drive their cars. Without the business that followed that year on accessory sales, I'm sure that today would find me in some other position than that of a happy, prosperous transportation merchant."

The Ideal Reserve Valve is designed to be placed on the inside of the gasoline tank. By using this method leaks are eliminated. It can be used either in connection with vacuum tank system or gravity feed. There are no complicated parts and it can be installed on any tank in a few minutes.

When feeding on a regular supply of fuel, the knob at the top of the tank is pushed down and gasoline is fed through the top of the outlet on the inside of the tank. When the gasoline is used up to this point, all that is necessary is to pull the knob up. The remainder of the gasoline in the tank feeds out through the opening in the bottom part of the valve. They are made with standard fittings and carried in stock for a number of standard tanks. A special fitting is supplied with Ford size and can be attached in Ford tank fittings without soldering. Price complete with outlet flange as shown \$2.50, Ford size \$2.30. Ideal Equipment Company, Indianapolis, Ind.

A new material for cleaning and polishing cars which is said to be both superior and cheaper than cheesecloth is being put on the market by the Baylis Sanitary Supply Co., 341 West Superior St., Chicago, Ill. It is sold in continuous

rolls which average from 25 to 35 pounds and the gauze averages 12 yds. to the pound, being 17 inches wide and put up in tubular rolls. The price is \$0.60 a pound, F.O.B. Chicago.

The Modern Equipment Co., Greensburg, Pa., announces the Kumford Klutch for Fords, designed to fit over regular Ford clutch pedal and connect to motor bearer. The Kumford Klutch will enable the driver of the Ford car to climb a hill in low speed without keeping his foot depressed on the clutch pedal. Once put into low speed, the Kumford Klutch stays "put" until released by a slight pressure. This locking feature of the clutch does not affect shifting from low to high gear because the Kumford is operated by a movement of the foot which is necessary only when locking is desired.

Tiffany Parking Lamps are made by the Tiffany Mfg. Co., 50 Spring street, Newark, N. J. They are made in two styles, known as the Standard and Special models. The standard model is red and white jeweled without the green jewel shown in the cut of the special model on this page. The prices range from \$1.50 to \$2. These lights fit flush with the fender, throwing the red light to the rear and the white to the front.

The Milwaukee Brush Manufacturing Co., Milwaukee, Wis., has announced several brushes, useful in cleaning garage floors, windows and the exterior and interior of automobiles. These brushes are known as the Wisco line and are made with steel wire and hair surfaces. The steel wire brushes are designed in various shapes for cleaning parts of the engine and power plant. Softer brushes of hair for washing fenders and the bodies of cars are also made. Spark plug, chain and gear and steel wire carbon removers are a specialty of the company.

Acme-Lite illuminates the thermometer tube of the motor meter with a greenish light that will not hurt the eyes of the driver. It shows at all times, the position of the needle while the front lens acts as a parking lamp or auxiliary head lamp. The Acme-Lite is the product of the Atloc Co., 612 Ferry avenue, East, Detroit. All parts are brass nickel plated and the lens is held in place by a specially designed ring which is easily removed. It can be hooked in on any of the dash switches or if desired, an individual switch can be used.

The Weed Sentry Bumper is made by the American Chain Co., Bridgeport, Conn. Safety fittings are used with this bar and a pair of shims is furnished to accommodate the fittings to the bar. The list price of this bumper, nicked, is \$21.

COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Chicago	Commercial Vehicle Show	Sept. 1-7
Chicago	Chicago Closed Car Show, Coliseum	Oct. 13-20
Chicago	Annual Salon, Drake Hotel	Jan. 26-Feb. 2, 1924
Columbus, Ga.	Automobile Show	Oct. 15-20
Dallas, Texas	Annual Fall Show	Oct. 13-23
Dallas, Texas	Annual Automobile Show	Feb. 11-17, 1924
Danbury, Conn.	Automobile Show in Conjunction with State Fair	Oct. 1-6
Fresno, Calif.	Automobile Show	Sept. 28-Oct. 5
Indianapolis	Annual Fall Automobile and Accessory Show	Sept. 3-8
Little Rock, Ark.	Annual Automobile Show	Oct. 8-13
Louisville, Ky.	Automobile Show at the Jefferson County Armory	Feb. 18-23
Memphis	Annual Automobile Show	Sept. 28-30
Milwaukee	Ninth Annual Fall Show in Conjunction with Wisconsin State Fair	Sept. 3-8
Muscatine, Iowa	Automobile Show	Sept. 5-8
New York	Annual Closed Car Show	Oct. 1-6
New York	Annual Electrical and Industrial Exposition	Oct. 17-27
New York	Foreign Automotive Association Exposition	Nov. 4-10
New York	Annual Salon, Hotel Commodore	Nov. 11-17
Peoria, Ill.	Implement and Vehicle Show	Sept. 26-Oct. 6
Pittsburgh	Annual Fall Show at the Moor Square Gardens	Sept. 22-29
Richmond, Ind.	Wayne County Fair Assn. Passenger Car Show	Sept. 11-14
Sacramento	Annual Automobile Show	Sept. 3-8
Salt Lake City	Fall Show in Conjunction with State Fair	Oct. 1-6
Sioux City, Ia.	Automobile Show in Conjunction with Annual Fair	Sept. 16-22

Waco, Texas	Annual Automobile Show	Oct. 20-27
Washington, D. C.	Annual Fall Closed Car and Accessory Show	Oct. 20-Nov. 5
Washington, D. C.	Annual Fall Automobile Show	Oct. 28-31

FOREIGN SHOWS

Buenos Aires	Annual Automobile Exposition	Nov. 1-15
London	Motor Car Exposition	Nov. 2-10
Montevideo, Uruguay	Automobile Show	September
Montreal	Closed Car Show	Sept. 29-Oct. 6
Ottawa, Ont.	Automobile Show	Sept. 7-17
Paris	Automobile Show at Grand Palais	Oct. 4-10
Paris	Truck and Tractor Show at Grand Palais	Oct. 24-Nov. 2

RACES

Fresno, Calif.	Auspices of the A. A. A.	Sept. 23
Italy	Monza Speedway, 500 miles	Sept. 9
Kansas City	Speedway, Auspices of the A. A. A.	Oct. 17
Los Angeles		Nov. 29

CONVENTIONS

Boston, Mass.	Fall Convention, M. A. M. A.	Sept. 19-21
Chicago	Exhibit and Convention of Automotive Equipment Association	Nov. 12-17
Cleveland, O.	Society of Automotive Engineers Production Meeting	October
Cleveland, O.	Thirtieth Annual Convention, National Assn. of Farm Equipment Manufacturers	Oct. 24-26
Columbus, O.	Annual Convention, Ohio Trade Assn.	Dec. 5-6
Detroit	S. A. E. Annual Meeting	Jan. 22-25, 1924
Eaglesmere Park, Pa.	Summer Meeting of the Automotive Electric Association	Sept. 11-14
New York	National Tire Dealers' Assn. Convention	Nov. 13-15

SQUEEKS & RATTLES

C'mon gang

WELL—I'LL BE——

By "Kay Em" Roberts

I bought a car the other day, somewhere on auto row, and forthwith drove said car away and in a week or so, the thing, to my profound dismay, just died and wouldn't go. I'd heard it said they often balk, for reasons two or three, and I recalled the line of talk that salesman handed me: "Our modern people never walk, they always drive," said he. I wondered, as I raised the hood, if what he said was true, I looked the motor over good and turned a little screw; I knew not, really, if I should—or what to do. I found a jigger on the side and moved it up and down but, strange to say, the more I tried the less I knew, I found, so then and there did I decide I'd hit the trail for town. When I arrived unto the place where I had bought my car I found my man and in his face he wore a fat cigar. Said I, "You move a single pace, I'll slay you where you are!" Then I explained to him my plight and told him of my woe, whereupon he said he's make it right or hand me back my dough, and he went home with me that night prepared to make her go. Now his procedure was no trick but any man may glean; he had me figured as a hick with not much in my bean. Said he, "your flivver isn't sick—it just needs gasoline."

(The news editor passes this on to Squeeks & Rattles and we blush as we offer it to you. The head on it was "Not a Fish Story." No one would deny that—fish stories are sometimes likely.)

VINEYARD HAVEN, Mass., Aug. 25.—Motor cars have done some freaky stunts in the past, but the one owned by Garrett Richards is claimant for the prize as a tree climber. When rolling along the highway in West Tisbury, the car, which is of the bug type, swerved on the road, struck a young oak tree, bent it at an angle of 45 degrees and then kept on going.

It shinned up the entire length of the tree and made a perfect catapult curve landing in the middle of another tree 20 feet away. A branch of the second tree, unable to bear the weight, let it drop to the ground where it turned over. Mr. and Mrs. Richards were tipped out of the car, but landing in the underbrush they were not injured. They secured help, got the car righted, and after relating their story to the police, and proving it by the bark scraped off one tree and the broken bough on the other, they motored home.

I Don't

Most motorists are blooming fools,
They trifle with the traffic rules.
I don't.

No man should try to get the drop
On any seasoned traffic cop,
Nor fail to heed his sign to stop.
I don't.

A man should never drive too fast,
Or brag about the cars he's passed.
I don't.

For Safety First should be his creed.
There really isn't any need
To drive a car at reckless speed.
I don't.

A man should never lose his bean
When piloting a gas-machine.
I don't.

On city street or open road,
A man should never break the code,
Nor fellow-farers incommode.
I don't.

He should not scare equestrians,
Nor chase the poor pedestrians.
I don't.

In fact, I have no car to run,
I'm shy the coin to purchase one,
You'd think I wouldn't have much fun.
I don't.

—Bottles.

A thought for today: "A rolling stone is worth two in the bush."

Or, "He who laughs last, gets the worm."

—LEW BRICATION.

Current Motor Truck Specifications

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE				REAR AXLE		TIRES		MAKE AND MODEL	Tons Capacity	Price	ENGINE				REAR AXLE		TIRES		
			Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear				Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear	
Ace.....	30	1 1/2	\$2600	Mi-112	3 1/2 x 5	B-L	B-L	Ti-6560	WO.	31x3 1/2	34x5k	Double Dr. DFT 3	4000	Bu-ETU	4 1/2 x 5 1/2	B&B	Ovn.	Ovn.	Wo-5511	SB.	33x5	33x5n
Ace.....	40	2-2 1/2	3250	Mi-102	4 1/2 x 5 1/2	B-L	B-L	Ti-6460	WO.	36x4k	36x7k	Duplex.....	G1	Bu-WTU	3 1/2 x 5 1/2	B-L	Ovn.	Sh-1501	WO.	33x5	36x5	
Ace.....	60	3	3800	Mi-102	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.	36x4k	36x8	Duplex.....	GH 1 1/2	Bu-WTU	3 1/2 x 5 1/2	Cov.	Cov.	Sh-103	WO.	35x5n	33x7n	
Acme.....	20	3-1		Co-N	3 1/2 x 5	B&B	Cot.	Ti-6250	WO.	34x5n	34x5n	Duplex.....	A2	Hi-400	4 1/2 x 5 1/2	Cov.	Cov.	Sh-103	WO.	35x5n	33x7n	
Acme.....	30	1-1 1/2		Co-N	3 1/2 x 5	B&B	Cot.	Ti-6352	WO.	34x3 1/2	31x5	Duplex.....	AC 2 1/2-3	Hi-400	4 1/2 x 5 1/2	B-L	B-L	Vu-4	WO.	34x5	36x8	
Acme.....	40	1 1/2-2		Co-J1	3 1/2 x 5	B&B	Cot.	Ti-6460	WO.	34x3 1/2	31x5	Duplex.....	E 3 1/2	Bu.....	4 1/2 x 5 1/2	B-L	B-L	Ovn.	IG.	36x8	36x8	
Acme.....	60	2 1/2-3		Co-L1	4 1/2 x 5 1/2	B&B	Cot.	Ti-6560	WO.	36x4	36x7											
Acme.....	90	3 1/2-4 1/2		Co-L1	4 1/2 x 5 1/2	B&B	Cot.	Ti-6660	WO.	36x5	40x10											
Acme.....	125	5-6 1/2		Co-B5	4 1/2 x 6	B&B	Cot.	Ti-6760	WO.	36x6	40x12											
Amer. La France	5	4950	Ovn.	4 1/2 x 6	Ovn.	Ovn.	Ovn.	WO.	36x5	36x5												
Amer. La France	5	5500	Ovn.	4 1/2 x 6	Ovn.	Ovn.	Ovn.	WO.	36x6	40x6												
Armleder.....	21	1 1/2		Bu-GTU	3 1/2 x 5 1/2	Ful.	Ful.	Ti-6460	WO.	31x3 1/2	34x6k											
Armleder. HWB	2 1/2			Bu-HTU	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.	36x4k	36x4dk											
Armleder. HWC	2 1/2			Co-C1	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.	36x4k	36x4dk											
Armleder. KWB	3 1/2			Bu-YTU	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO.	36x5k	36x5dk											
Armleder. KWC	3 1/2			Co-E1	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO.	36x5k	36x5dk											
Atlas.....	25	1 1/2	1495	Bu-WTU	3 1/2 x 5 1/2	B&B	Ovn.	Ovn.	WO.	34x4 1/2	31x4 1/2											
Atlas.....	40	1 1/2	1950	Co-J1	3 1/2 x 5	B&B	Ovn.	Ovn.	WO.	36x6n	36x6n											
Atterbury.....	20R	1 1/2-2	2175	Co-K1	3 1/2 x 5	Ful.	Ful.	Ti-6460	WO.	34x4k	34x6k											
Atterbury.....	22C	1 1/2-2	13375b	Co-K1	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.	36x4k	36x4d											
Atterbury.....	22D	1 1/2-2	1275b	Co-L1	4 1/2 x 5 1/2	B-L	B-L	Ti-6660	WO.	36x5	40x6d											
Atterbury.....	22E	1 1/2-2	11975b	Co-B2	4 1/2 x 6	B-L	B-L	Ti-6760	WO.	36x6	40x7d											
Autocar.....	21	1 1/2-2	2200	Ovn.	4 1/2 x 5 1/2	Ovn.	Ovn.	Ovn.	DR.	34x4	34x6											
Autocar.....	27	2-3	3103	Ovn.	4 1/2 x 5 1/2	Ovn.	Ovn.	Ovn.	DR.	34x5	36x8											
Autocar.....	26	1-6	4200	Ovn.	4 1/2 x 5 1/2	Ovn.	Ovn.	Ovn.	DR.	34x6	36x12											
Available.....	1H	1 1/2	2150	He-CU3	4x5	B-L	B-L	Ti-6160	WO.	36x3 1/2	36x5											
Available.....	1H	1 1/2	3160	He-CU3	4x5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x5											
Available.....	1H	1 1/2	4175	He-MU3	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO.	36x5	40x5d											
Available.....	1H	1 1/2	5375	He-T3	5x6	B-L	B-L	Ti-6760	WO.	36x6	40x12											
Avery.....	1-1 1/4	3250	Ovn.	3x4	Ovn.	Ovn.	To-OX2	IG.	34x5n	34x5n												
Bessemer.....	G1	1450	Co-N	3 1/2 x 5	Ful.	Ful.	To-A	IG.	35x5n	35x5n												
Bessemer.....	H2	1 1/2	1907	Co-N	3 1/2 x 5	B&B	Bak.	LM-7150	DR.	36x3 1/2	36x5											
Bessemer.....	H2	2 1/2	2305	Co-C2	4 1/2 x 5 1/2	B&B	Bak.	LM-7250	DR.	36x4	36x4d											
Bessemer.....	K2	1	3195	Co-E7	3 1/2 x 5 1/2	B&B	Det.	To-E	IG.	36x5	36x10											
Bethlehem.....	KN1	1385	Ovn.	4 1/2 x 5 1/2	B&B	Det.	Wi-1000	SB.	33x5n	34x6												
Bethlehem.....	GN2	2185	Ovn.	4 1/2 x 5 1/2	B&B	Det.	Wi-1000	SB.	33x5n	34x6												
Bethlehem.....	GN3	2985	Ovn.	4 1/2 x 5 1/2	B&B	Det.	Wi-89E	DR.	34x4	36x8												
Brockway.....	E21	1907	Wi-SU	4x5	B-L	B-L	Co-5200	SB.	33x5n	33x5n												
Brockway.....	S1	1 1/2	Wi-SU	4x5	B-L	B-L	Ti-6160	WO.	36x4	36x6												
Brockway.....	K2	1 1/2	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x8												
Brockway.....	T3	915	Co-L1	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO.	36x5	36x5d												
Buick.....	23-45	3 1/2	Ovn.	3 1/2 x 4 1/2	Ovn.	Ovn.	Ovn.	SB.	31x4n	31x4n												
Caso.....	TR	575	Ovn.	4 1/2 x 5 1/2	TD.	Ovn.	To-C139	IG.	36x6n	38x7n												
Chevrolet.....	Sup 1	575	Ovn.	3 1/2 x 4	Ovn.	Mun.	Ovn.	SB.	31x4n	34x4 1/2												
Clinton.....	(See Schwartz)		Co-N	3 1/2 x 5	B&B	B-L	Ti-5511	SB.	34x5n	34x5n												
Clydesdale.....	10	1 1/4	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Ti-6460	WO.	36x4	36x7												
Clydesdale.....	6 1/2	3 1/2	Co-L1	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.	36x5	36x5d												
Clydesdale.....	4 1/2	3 1/2	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6666	WO.	36x6	40x6d												
Clydesdale.....	2 1/2	3 1/2	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO.	36x7	40x7d												
Commerce.....	9 1/2-1 1/4	3250	Co-N	3 1/2 x 5	Det.	Det.	SA-D16	SB.	32x4 1/2	36x5 1/2												
Commerce.....	14 1/2	3250	Co-JA	3 1/2 x 5	B-L	B-L	Ti-6560	WO.	36x4	36x5k												
Commerce.....	25 1/2	3250	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x7k												
Corbett.....	E1	3 1/2	HS-700	3 1/2 x 5	B-L	B-L	Sh-100	WO.	34x4 1/2	34x4 1/2												
Corbett.....	D1 1/2	3 1/2	Co-N	3 1/2 x 5	B-L	B-L	Sh-100	WO.	34x4 1/2	34x4 1/2												
Corbett.....	C2	3 1/2	Co-JA	3 1/2 x 5	B-L	B-L	Sh-150	WO.	36x4 1/2	34x5k												
Corbett.....	R3	3 1/2	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Sh-103	WO.	36x3 1/2	36x7k												
Corbett.....	R3	3 1/2	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Sh-21	WO.	36x4k	36x8												
Corbett.....	A3 1/2-4	3250	Co-L1	4 1/2 x 5 1/2	B-L	B-L	Sh-21	WO.	36x4	36x8												
Corbett.....	A3 1/2-4	3250	Co-L1	4 1/2 x 5 1/2	B-L	B-L	Sh-32	WO.	36x5	36x10												
Corbett.....	A3 1/2-4	3250	Co-B5	4 1/2 x 6	Del.	B-L	Sh-51	WO.	36x6	40x12												
Day-Elder.....	AN 1 1/2	1600	Bu-WTU	3 1/2 x 5 1/2	B-L	B-L	Ti-6352	WO.	34x3 1/2	31x4												
Day-Elder.....	BN 2	2375	Co-JA	3 1/2 x 5	B-L	B-L	Ti-6460	WO.	31x3 1/2	34x5												
Day-Elder.....	DN 2 1/2	2975	Co-K1	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x7												
Day-Elder.....	CN 3	3695	Bu-HTU	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x8												
Day-Elder.....	FN 1	4295	Co-L1	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO.	36x5	36x5d												
Day-Elder.....	EN 5-6	4945	Bu-YTU	4 1/2 x 6	B-L	B-L	Ti-6760	WO.	36x5	40x6d												
Dearborn.....	E1	1980	Bu-Mu	3 1/2 x 5 1/2	B-L	B-L	Wi.....	WO.	35x5n	35x5n												

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES	
			Make & Model	Bore & Stroke			Make & Model	Final Drive	Front	Rear
Larrabee...X2	1-1 1/2	.....	Co-BL	3 3/4 x 5 1/2	B-L	B-L	Sh-1480	SB	34x5n	34x5n
Larrabee...J4	1 1/2-2 1/2	.....	Co-L	3 3/4 x 5 1/2	B-L	B-L	Sh-1501	WO	34x3 3/4	34x5k
Larrabee...K5	2 1/2-3 1/2	.....	Co-L	4 1/2 x 5 1/2	B-L	B-L	Sh-22	WO	36x4	36x8
Larrabee...L4	3 1/2-4 1/2	.....	Co-L	4 1/2 x 5 1/2	B-L	B-L	Sh-31	WO	36x5	36x10
Maccar...H2	1 1/2	.....	Co-K	4 1/2 x 5 1/2	B-L	B-L	Ti-6460	WO	36x4	36x6
Maccar...H3	1 1/2	.....	Co-K	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x4d
Maccar...H3	1 1/2	.....	Co-L	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x5d
Maccar...H3	1 1/2	.....	Co-L	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO	36x5	36x6d
Maccar...G-5	5-6	.....	Co-B	4 1/2 x 5 1/2	B-L	B-L	Ti-6760	WO	36x6	40x6d
MacDonald...O-3	3-5	\$5500b	Bu-WTU	3 3/4 x 5 1/2	B-L	B-L	**Own	IG	36x6	36x10
MacDonald...A-7	7 1/2	8030b	Bu-YTU	4 1/2 x 6	B-L	B-L	**Own	IG	40x7	40x14
Mack...AB	1 1/2	3000	Own	4x5	Own	Own	Own	Ch	36x4	36x3 3/4d
Mack...AB	1 1/2	3150	Own	4x5	Own	Own	Own	DR	36x4	36x3 3/4d
Mack...AB	2 1/2	3300	Own	4 1/2 x 5	Own	Own	Own	Ch	36x4	36x4d
Mack...AB	2 1/2	3750	Own	4 1/2 x 5	Own	Own	Own	DR	36x4	36x4d
Mack...AB	2 1/2	3400	Own	4 1/2 x 5	Own	Own	Own	Ch	36x4	36x4d
Mack...AB	2 1/2	3850	Own	4 1/2 x 5	Own	Own	Own	DR	36x4	36x4d
Mack...AC	3 1/2	4950	Own	5x6	Own	Own	Own	Ch	36x5	40x5d
Mack...AC	3 1/2	5500	Own	5x6	Own	Own	Own	Ch	36x6	40x6d
Mack...AC	3 1/2	5750	Own	5x6	Own	Own	Own	Ch	36x6	40x12
Mack...AC	3 1/2	6000	Own	5x6	Own	Own	Own	Ch	36x7	36x7d
Mack...AC	3 1/2	3400	Own	4 1/2 x 5	Own	Own	Own	Ch	36x4	36x4d
Mack...AC	3 1/2	4950	Own	5x6	Own	Own	Own	Ch	36x5	40x5d
Mack...AC	3 1/2	5500	Own	5x6	Own	Own	Own	Ch	36x6	40x6d
Mack...AC	3 1/2	5750	Own	5x6	Own	Own	Own	Ch	36x6	40x12
Mack...AC	3 1/2	6000	Own	5x6	Own	Own	Own	Ch	36x7	40x12
Mason...H	1 1/2	1200	He	4x5	Hoo	War	FL	SB	34x5n	34x5n
Master...H	1 1/2	2000	Bu-WTU	3 3/4 x 5 1/2	Ful	Ful	Ti-5511	SB	33x5n	33x5n
Master...H	1 1/2	2175	Bu-OU	4 1/2 x 5 1/2	Ful	Ful	Ti-6460	WO	34x4	34x6
Master...H	1 1/2	2875	Bu-ETU	4 1/2 x 5 1/2	Ful	Ful	Ti-6560	WO	34x4	36x8
Master...H	1 1/2	3150	Bu-YTU	4 1/2 x 6	B-L	B-L	Ti-6666	WO	36x5	40x10
Master...H	1 1/2	3400	Bu-YTU	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x5	40x12
Master...H	1 1/2	3850	Bu-ATU	4 1/2 x 6 1/2	B-L	B-L	Ti-6760	WO	36x6	40x14
Maxwell...H	1 1/2	1995	Own	3 3/4 x 4 1/2	Own	Own	Ti	WO	35x5n	35x5n
Menominee...H	1 1/2	1650	Wi-SU	4x5	B&B	Det	Co-5200	SB	35x5n	35x5n
Menominee...H	1 1/2	2000	Wi-PAU	3 3/4 x 5	Ful	Del	Wi-800G	WO	36x3 3/4	36x5k
Menominee...H	1 1/2	2175	Wi-EAU	4x6	Ful	Del	Wi-800H	WO	36x3 3/4	36x5k
Menominee...H	1 1/2	2875	Wi-TAU	4x6	Ful	Del	Wi-800J	WO	36x4	36x8
Menominee...H	1 1/2	4850	Wi-RAU	4x6	B&B	Det	Ti-6760	WO	36x6	40x12
Moline...H	10 1/2	1995	Own	3 1/2 x 5	B&B	Own	To-A	IG	34x5n	36x6n
Moreland...R.R.	1	1595	He-O	4x5	B-L	B-L	Ti-5512	WO	34x5n	34x5n
Moreland...BX	1 1/2	1989	He-O	4x5	B-L	B-L	Ti-6461	WO	36x3 1/2	36x5n
Moreland...EX	2	2625	Co-K	4 1/2 x 5 1/2	Own	Own	Ti-6461	WO	36x4	36x8
Moreland...AX	3	3500	Co-L	4 1/2 x 5 1/2	Own	Own	Ti-6560	WO	36x5	36x10
Moreland...RX	5	4600	Co-B5	4 1/2 x 6	Own	Own	Ti-6666	WO	36x6	40x12
Nash...2018	1-1 1/2	1595	Own	3 3/4 x 5 1/2	B&B	Det	Cl-1D	IG	34x4	34x5
Nash...4017F	2-2 1/2	2750	Bu-HU	4 1/2 x 5 1/2	B&B	Own	Own	IG	36x6	36x6
Nash...3018	2-2 1/2	2150	Own	3 3/4 x 5 1/2	B&B	Det	Cl-2D	IG	34x4	34x7
Nash...5018	2 1/2	2250	Own	3 3/4 x 5 1/2	B&B	Det	Cl-2D	IG	34x4	34x7
Noble...A-75	1	1395	Bu-WTU	3 3/4 x 5 1/2	Ful	Ful	Ti-300	SB	34x4 1/2	34x1 1/2
Noble...A-21	1 1/2	1899	Bu-WTU	3 3/4 x 5 1/2	Ful	Ful	Sh-1501	WO	34x5	34x5
Noble...B-31	2	3795	Bu-CTU	3 3/4 x 5 1/2	Ful	Ful	Sh-103	WO	36x4	36x7
Noble...D-512	2 1/2	3150	Bu-ETU	4 1/2 x 5 1/2	Ful	Ful	Sh-21	WO	36x4	36x8
Noble...E-71	3 1/2-5	3850	Bu-YTU	4 1/2 x 6	Ful	War	Sh-30	WO	36x5	36x10
Old Reliable...B	2 1/2	3500	Wi-UAU	4 1/2 x 6	Ful	Ful	Sh-21	WO	34x4	36x8
Old Reliable...C	3 1/2	4250	Wi-VAU	4 1/2 x 6	Ful	Ful	Sh-31	WO	36x5	36x12
Old Reliable...D	5	5090	Wi-RAU	4 1/2 x 6	Own	Own	Sh-51	WO	36x6	40x12
Old Reliable...K	7 1/2	6000	Wa-P	4 1/2 x 6 1/2	Own	Own	Own	Ch	36x6	40x14
Oldsmobile...T	1	1095	Own	3 1/2 x 5 1/2	B&B	War	To-OX2	IG	35x5n	35x5n
Oneida...B	1 1/2-2	2825	Hi-400	1x5 1/4	Ful	Ful	Wi-800J	WO	36x3 1/2	36x7
Oneida...C	2 1/2	3200	Hi-400	1x5 1/4	Ful	Ful	Wi-900C	WO	36x4	36x7
Oneida...D	3 1/2	4050	Hi-200	1 1/2 x 5 1/2	Ful	Ful	Ti-6652	WO	36x5	36x10
Overland...91ce	1 1/2	425	Own	3 3/4 x 4	B&B	Own	Own	SB	30x3 1/2	30x3 1/2
Patriot, Revere...1	1	1295	Co-N	3 3/4 x 5	B&B	Cov	Own	WO	35x5n	35x5n
Patriot, Lincoln...2	1 1/2	2400	Hi-400	1 1/2 x 5 1/2	Cov	Ful	Ti-6560	WO	34x4n	34x4n
Pat., Washington...3	3	3000	Hi-200	4 1/2 x 5 1/2	Cov	Cov	Wi-900	WO	36x5n	36x5n
Pierce Arrow...XA	2	3300	Own	4x5 1/2	Own	Own	Own	WO	36x4	36x4d
Pierce Arrow...XB	3	3500	Own	4x5 1/2	Own	Own	Own	WO	36x5	36x5d
Pierce Arrow...WC	4	4600	Own	4 1/2 x 6 1/2	Own	Own	Own	WO	36x6	36x6d
Pierce Arrow...WD	5	4700	Own	4 1/2 x 6 1/2	Own	Own	Own	WO	36x6	40x7d
Pierce Arrow...RE	6	5100	Own	4 1/2 x 6 1/2	Own	Own	Own	WO	36x6	40x7d
Pierce Arrow...RF	7	5200	Own	4 1/2 x 6 1/2	Own	Own	Own	WO	36x6	40x8d
Rainier...R31	3 1/2	.....	Co-N	3 3/4 x 5	B-L	B-L	Ti-6250	WO	35x5n	35x5n
Rainier...R29	1 1/2	.....	Co-N	3 3/4 x 5	B-L	B-L	Ti-6250	WO	34x3 1/2	34x4
Rainier...R36	1 1/2	.....	Co-J4	3 3/4 x 5	B-L	B-L	Ti-6460	WO	34x3 1/2	34x5
Rainier...R28	2-2 1/2	.....	Co-K	4 1/2 x 5 1/2	B-L	B-L	Sh-103	WO	34x4	34x7
Rainier...R20	2 1/2	.....	Co-K	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x8
Rainier...R25	3 1/2-5	.....	Co-L	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO	36x5	36x5d
Rainier...R27	6	.....	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d
Reo...F	1 1/2	1185	Own	4 1/2 x 4 1/2	Own	Own	Own	SB	34x4 1/2	34x4 1/2
Reo...H	1 1/2	1815b	Own	4 1/2 x 4 1/2	Own	Own	Own	SB	33x4 1/2	33x4 1/2
Republic...75	3 1/2	1395b	Ly-KB	3 3/4 x 5	Own	Own	To-750	IG	33x5n	33x5n
Republic...11X	1 1/2	1795	Co-J4	3 3/4 x 5	Ful	Ful	To-CT2	IG	34x4	34x6
Republic...19W	2 1/2	.....	Wa-FU	4x5 1/2	Ful	Ful	To-CT2	IG	36x4	36x8
Republic...13	2 1/2	2195	Co-K	4 1/2 x 5 1/2	Ful	Ful	To-CT2	IG	36x4	36x8
Republic...20	3 1/2	3095	Co-L	4 1/2 x 5 1/2	Ful	Ful	To-E	IG	36x5	36x5d
Rowe...CW	11	3000	Wi-CAU	3 3/4 x 5	B-L	B-L	Sh-1501	WO	36x6n	36x6n
Rowe...CDW	2 1/2	3300	Wi-EAU	4x5	B-L	B-L	Sh-103	WO	34x5	36x3 1/2
Rowe...GSW	3 1/2	4150	Wi-TAU	4x5	B-L	B-L	Sh-21	WO	34x5	36x4d
Rowe...HW	4	4500	Wi-UAU	4x6	B-L	B-L	Sh-31	WO	36x7	36x6d
Rowe...FW	5	4850	Wi-VAU	4x6	B-L	B-L	Sh-51	WO	36x7	40x6d
Ruggles...15	3 1/2	895	HS	3 1/2 x 5	M&E	Ful	Co	SB	32x4 1/2	32x4 1/2
Ruggles...20R	1 1/2	1375f	Own	4x5	B-L	B-L	Co-5200B	SB	34x5n	34x5n
Ruggles...40	2 1/2	2095	Own	4x5	B-L	B-L	Wi-65	DR	34x5n	34x7
Ruggles...40H	2 1/2	2295	Own	4x5	B-L	B-L	Wi-88E	DR	36x4	36x8
Sandow...CG&G	1	1795f	Co-N	3 3/4 x 5	Ful	Ful	Sh-1501	WO	34x3 1/2	34x5
Sandow...J	2 1/2	.....	Co-C4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x7
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12
Sandow...M	5	4325	Co-B5							

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE				REAR AXLE		TIRES			
			Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear	MAKE AND MODEL	Tons Capacity
Walter.....N2	1500	\$3800	Ow.....4x5 1/2	B-L.	B-L.	Ow.....DR.	36x4	36x8			Goftredson.....20	1500
Walter.....S5	1500	\$1000	Ow.....4x5 1/2	B-L.	War.	Ow.....DR.	36x6	40x6d			Goftredson.....40	1500
White.....15	3 1/2	2400	Ow.....3 3/4x5 1/2	Ow.	Ow.	Ow.....SP.	34x5n	34x5n			Goftredson.....50	1500
White.....20	2	3250	Ow.....3 3/4x5 1/2	Ow.	Ow.	Ow.....DR.	36x4	36x7d			Goftredson.....80	1500
White.....40	3 1/2	4200	Ow.....4 1/2x5 1/2	Ow.	Ow.	Ow.....DR.	36x5	40x5d			Goftredson.....100	1500
White.....45	5	4500	Ow.....4 1/2x5 1/2	Ow.	Ow.	Ow.....DR.	36x6	40x6d			Mapleleaf.....AA	1500
Wilcox.....AA1	1900	Bu-CTU	3 3/4x5 1/2	B-L.	B-L.	Ru-3600	SP.	35x5	35x5		Mapleleaf.....BB	1500
Wilcox.....BB1	2550	Ow.....4 1/2x5	B&B.	Ow.	Wa-2A.	DR.	36x6k	38x7k			Mapleleaf.....CC	1500
Wilcox.....CC	3000	Ow.....4 1/2x5	B&B.	Ow.	Wa-2A.	DR.	36x6k	40x8k			Mapleleaf.....DD	1500
Wilcox.....EE	3350	Bu-YTU	4 1/2x6	M&E	Ow.	Wa-5A.	DR.	36x5	36x10		National.....FA	1500
Wilcox.....F5	4350	Bu-ATU	4 1/2x6 1/2	M&E	Ow.	Wa-5A.	DR.	36x5	40x5		National.....GA	1500
Wilson.....C1	1350	He-O.	4 x5	B&B.	Cot.	Ti-6532	WO.	34x5n	34x5n		National.....HD	1500
Wilson.....F1	2270	Co-J4.	3 3/4x5	B&B.	Cot.	Ti-6540	WO.	36x3 1/2	36x5k		National.....NB	1500
Wilson.....EA	2825	Co-K4.	4 1/2x5 1/2	B&B.	Cot.	Ti-6560	WO.	36x4k	36x7k		National.....OA5	1500
Wilson.....G3	3685	Co-L4.	4 1/2x5 1/2	B&B.	Cot.	Ti-6660	WO.	36x5k	36x5d		Veteran.....M	1500
Wilson.....H5	4520	Co-B2.	4 1/2x6	B&B.	Cot.	Ti-6752	WO.	36x6k	40x6d		Veteran.....P2	1500
Yellow Cab.....M22	1500	Co-V4.	3 3/4x5	B-L.	B-L.	Ti-5762	SB.	33x4 1/2	33x4 1/2		Veteran.....R3	1500
Yellow Cab.....M42	1640	Co-V4.	3 3/4x5	B-L.	B-L.	Ti-6352	WO.	35x5n	35x5n		Veteran.....S4	1500
Yellow Cab.....N1 1/2	1740	Ow.....		B-L.	B-L.	Ti.....	WO.					

Current Tractor Specifications

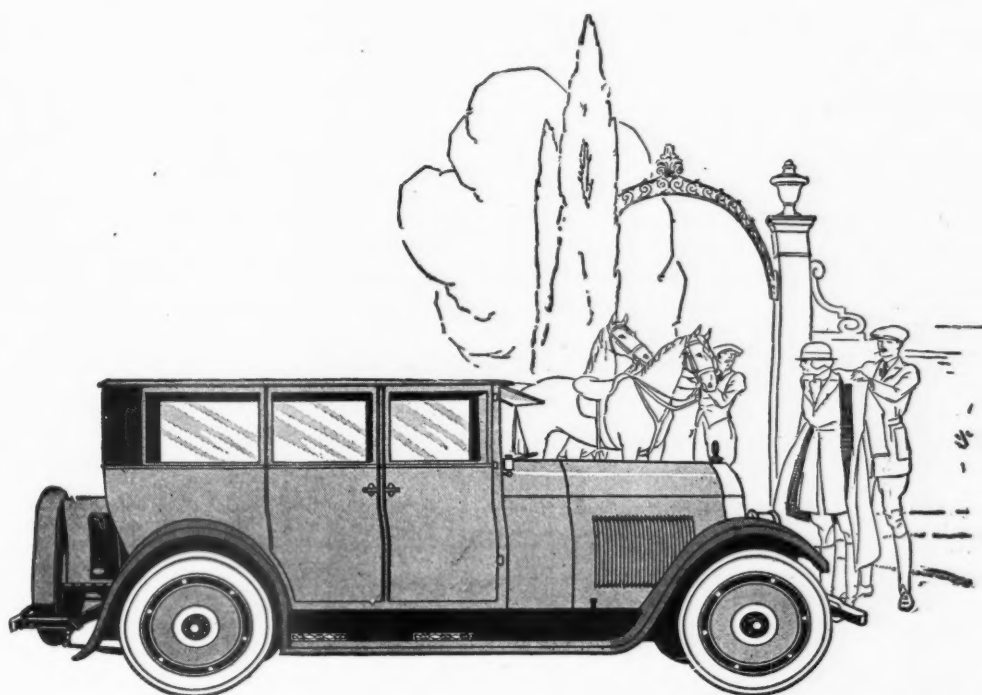
MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	Price	ENGINE				Weight (Lbs.)	Traction Members, Dimension, Diameter & Face (Ins.)	MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	Price	ENGINE				Weight (Lbs.)	Traction Members, Dimension, Diameter & Face (Ins.)										
				Make	No. of Cyls Bore & Stroke									Make	No. of Cyls Bore & Stroke														
Allis-Chalmers...	6-12	1	\$295	LeR.	4-3 1/4x4	2500	48x 6			Gray.....DU	18-36	4	2150	Wau.	4-4 1/2x6	6200			Rumely OilPull	30-60	8-10		Own.	2-10x12	26700	80x30			
Allis-Chalmers...	15-25	3	1185	Mid.	4-4 1/2x5	4700	48x12			Gray.....EU	22-40	4	2385	Wau.	4-5 x6	6000			Russell	15-30	3-4		Chi.	4-5 x6	6000	56x14			
Allis-Chalmers...	20-35	4	1885	Own.	4-4 1/2x6	6150	50x12			Hart-Parr.....	20-20	2		Own.	2-5 1/2x6	4438	46x10			Russell	20-40	4-5		Chi.	4-5 1/2x7	7900	60x16		
Allwork.....D	20-38	4-5	1695	Own.	4-5 x7	6500	48x14			Hart-Parr.....	30-30	3		Own.	2-6 1/2x7	5220	52x10			Russell	30-60	8-10		Own.	4-8 x10	22550	84x22		
Allwork.....G	14-28	3	1495	Own.	4-4 1/2x6	4800	48x12			Hart-Parr.....(Road)	30-30	3		Own.	2-6 1/2x7	5220	52x18			Shaw-Enochs (Gr.)	30-60	8-10		LeR.	4-3 1/4x4	4400	48x 8		
Allwork.....C	16-30	3	1295	Own.	4-5 x6	5200	48x12			Heider.....D	9-16	2		Wau.	4-4 1/2x6	4000	54x 8			Topp-Stewart.....B	30-45	4		Wau.	4-4 1/2x6	7800	42x12		
Aultman-Taylor.....	15-30	3-4	1900	Chi.	4-5 x6 1/2	7800	70x12			Heider.....C	12-20	3		Wau.	4-4 1/2x6	6000	57x10			Toro.....	6-10	2		8675	LeR.	4-3 1/4x4	2900	41x 9	
Aultman-Taylor.....	22-45	4-6	3100	Own.	4-5 1/2x8	12500	70x20			Heider.....M	5-10	1		LeR.	4-3 1/4x4	2800	46x 6			Townsend.....	10-20	2-3		800	Own.	2-6 1/2x7	4500	48x12	
Aultman-Taylor.....	30-60	8-10	4400	Own.	4-7 x9	22500	90x24			Huber.....(Light 4)	12-25	3		985	Wau.	4-4 1/2x6	5000	60x10			Townsend.....	15-30	3-4		1350	Own.	2-7 x8	6500	56x18
Avery.....15	15-30	3-4		Own.	4-4 1/2x6	4750	50x12			Huber.....(Super 4)	15-30	3			Mid.	4-4 1/2x6	6000	60x10			Townsend.....	25-50	4-8		2500	Own.	2-8 1/2x10	11500	60x24
Avery.....20-35	20-35	4-5		Own.	4-4 1/2x7	7500	60x16			LaCrosse.....M	6-12	1		507	Own.	2-4 x6	3000	48x 7			Traylor.....	6-12	1		500	LeR.	4-3 1/4x4	1750	38x10
Avery.....25-50	25-50	5-6		Own.	4-6 1/2x7	12500	60x20			LaCrosse.....H	12-24	3		850	Own.	2-6 x7	3800	56x10			Twin City.....	12-20	3		1200	Own.	4-4 1/2x6	4550	50x12
Avery.....45-65	45-65	8-10		Own.	4-7 1/2x8	22000	87 1/2x21			Lausson.....S	12-25	3			Mid.	4-4 1/2x6	4200				Twin City.....	20-35	5		2750	Own.	4-5 1/2x6	8100	60x20
Avery, Tr. Runner	3			Own.	4-4 x5 1/2	5000	x 8 1/2			Lausson.....T	15-30	4			Bea.	4-4 1/2x6	6200				Twin City.....	10-65	8		4750	Own.	4-7 1/2x9	23700	84x24
Avery, RoadRazer	3			Own.	6-3 x4	4600	42x 6			Leader.....B	12-18	2		375	Own.	2-6 1/2x6	4800	50x12			Uncle Sam.....C-20	12-20	2-3		990	Her.	4-4 x5	3000	46x12
Bates (St. Mule) H	15-25	3		Mid.	4-4 1/2x5	3600	48x10			Leader.....N	16-32	3-4		1275	Chi.	4-5 x6	5800	52x12			Uncle Sam.....B-19	20-30	3-4		1535	Bea.	4-4 1/2x6	4650	50x12
Bates (St. Mule) F	18-25	3		Mid.	4-4 1/2x5	4850	50x10			Leader.....GU	16-32	3-4		2150	Chi.	4-5 x6		*68x 9			Uncle Sam.....D-21	20-30	3-4		1485	Baa.	4-4 1/2x6	4600	50x12
Bates (St. Mule) G	25-35	4		Mid.	4-4 1/2x6	6500	x10			Lincoln.....A	15-30	3		1600	Bud.	4-4 1/2x6	5000	40x14			Wallis.....OK	15-27	3			Own.	4-4 1/2x6	3660	48x12
Bates (St. Mule) 40	30-40	4		Mid.	4-4 1/2x6	8500	*84x10			Little Giant.....B	16-22	4			Own.	4-4 1/2x5	5200	54x14			Waterloo Boy.....N	12-25	3		180	Ow.	2-6 1/2x7	5860	52x12
Bear.....B	25-35	4	1250	Ste.	4-4 1/2x6	6000	*64x12			Little Giant.....A	20-35	6			Own.	4-5 1/2x6	8700	66x20			Wetmore.....	12-25	3		1155	Wau.	4-4 x5 1/2	2900	46x10
Best.....30	20-30	4		Own.	4-4 1/2x6	8100	*88x11 1/2			Lombard.....	12-16	2			Own.	6-5 1/2x7	19000	x12			Wisconsin.....	16-30	3-4		1750	Chi.	4-5 x6	5600	52x12
Best.....60	40-60	9		Own.	6-10 1/2x8	18580	*89x20			London.....	12-25	3			Mid.	4-4 1/2x5		48x12			Wisconsin.....	22-40	4-5		2550	Chi.	4-5 1/2x7	7500	52x12
Bryan.....Steam	15-30	3	2500	Own.	2-4 x5	5500	52x12			McCork-Deering.....	10-20	2		850	Own.	4-4 1/2x5	3700	42x12			Yuba (Ball Tread).....	15-25	4		2750	Wis.	4-4 1/2x6	5750	*36x12
Case.....12-20	12-20	3	1095	Own.	4-4 1/2x5	4230	42x12			McCork-Deering.....	15-30	3		1250	Own.	4-4 1/2x6	5750	50x12			Yuba (Ball Tread).....	25-40	8		4500	Own.	4-5 1/2x7	10130	*48x17 1/2
Case.....15-27	15-27	3-4	1350	Own.	4-4 1/2x6	6000	52x14			Minneapolis.....	12-25	3			Own.	4-4 1/2x7	6600	56x12											
Case.....22-40	22-40	4-5	2650	Own.	4-5 1/2x8	10700	56x16			Minneapolis.....	17-30	3-4			Own.	4-4 1/2x7	6100	54x12											
Case.....40-72	40-72	8-10	1900	Own.	4-7 x8	21200	72x20			Minneapolis.....	22-44	4-5			Own.	4-6 x7	12410	62x20											
Caterpillar, 2 Ton	15-30	3		Own.	4-4 x5 1/2	4000	*			Minneapolis.....	35-70	8-10			Own.	4-7 1/2x9	22500	85x30											
Caterpillar, 5 Ton	25-40	4		Own.	4-4 1/2x6	9400	*			Moline (Un.).....D	9-8	2-3		725	Own.	4-3 1/2x5	4103	52x 8											
Caterpillar, 10 Ton	40-60	6		Own.	4-6 1/2x7	20000	*			Moline (Orc.).....D	9-8	2-3		725	Own.	4-3 1/2x5	3893	44x 8											
Cletrac.....F	9-16	2	815	Own.	4-3 1/4x4	1930	*42x 5 1/2			Monarch.....C	20-30	4		3800	Bea.	4-4 1/2x6	8700	*66x12											
Cletrac.....W	12-20	2	1345	Own.	4-4 x5 1/2	3455	*48x 8			Monarch.....D	25-40	5		5000	Bea.	4-4 1/2x6	12000	*67x12											
Eagle.....F	12-22	3		Own.	2-7 x8	5850	48x12			Monarch.....E	35-60	6		6000	Bea.	6-4 1/2x10	15000	*80x12											
Eagle.....H	16-30	4		Own.	2-8 x9	7100	48x12			Nichols-Shepard.....	20-42	4-6		2600	Own.	2-8 1/2x10	13500	64x20											
E-B.....AA	12-20	3		Own.	4-4 1/2x5	4550	51x12			Nichols-Shepard.....	25-50	6-8		3320	Own.	2-8 1/2x12	20500	60x28											
E-B.....BB	12-20	3		Own.	4-4 1/2x5	6500	60x12			Nichols-Shepard.....	35-70	8-12		1030	Own.	2-10x14	30000	73x32											
E-B.....CC	16-32	4		Own.	4-5 1/2x7	9400	72x16			Pioneer.....G	18-36	6			Own.	4-5 1/2x6	6500	60x18											
Fagot.....19-12	12		1200	Lye.	4-3 1/2x5	3600	48x 8 1/2			Pioneer.....C	40-75	10			Own.	4-7 x8	24000	96x24											
Fordson.....18	2		395	Own.	4-4 x5	2562	42x12			Rumely OilPull	12-20	3			Own.	2-6 x8	6682	51x12											
Frick.....A	12-20	2	1000	Ed.	4-4 x6	5800	60x10			Rumely OilPull	16-30	4			Own.	2-7 x8 1/2	9600	56x16											
Frick.....C	15-28	3	1800	Bud.	4-4 1/2x6	6730	60x12			Rumely OilPull	20-40	6			Own.	2-8 x10	12820	64x20											

GARDEN TRACTORS															
MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	Price	ENGINE				Weight (Lbs.)	Traction Members, Dimension, Diameter & Face (Ins.)						
				Make	No. of Cyls Bore & Stroke										
Aro.....F	3-6	1	\$385	Own.	1-4 1/2x5	1000	30x 4								
Beeman.....Jr.	1 1/2-1		195	B&S.	1-2 1/2x2 1/2	210	30x 3								
Beeman.....K	1 1/2-1		265	Own.	1-3 1/4x3 1/4	550	25x 3								
Bolens.....	1		180	B&S.	1-2 1/2x2 1/2	190	30x 3								
Centaur.....1923	2 1/2-5 1/2		1	315	N-W.	1-4 1/2x3 1/2	700	28x 4							
Do-It-All (Jack)	2 1/2-6		1	395	Own.	1-3 1/2x3 1/2	750								
Do-It-All (Baby)	2 1/2-6		1	495	Own.	1-4 1/2x5	1200	26x 2 1/2							
Do-It-All (Twin 12)	4-15		1	495	Own.	2-3 3/4x3 1/2	800	32x 4							
Kinkade.....1 1/2-3 1/2	1		190	Own.	1-3 x3 1/2	180	22x 5 1/2								
M.B.M. Red E	1-4 1/2		250	Own.	1-3 1/2x4	140	20x 3								
Motor Maculivator	1		148	Own.	1-2 1/2x3 1/2	210	19x 3 1/2								
N.B.....2	6	1	375	Own.	2-2 1/2x4	750	32x 4								
Utilitor.....501A	2 1/2-4	1	295	Own.	1-3 1/2x4 1/2	750	24 1/2x 4								
Utilitor.....501A	2 1/2-4	1	340	Own.	1-3 1/2x4 1/2	925	24 1/2x 4								

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES						Wheel Base (Ins.)	Tire Size (Ins.)	NAME AND MODEL	ENGINE			ELECTRICAL SYSTEM		Clutch Type and Make	Gearset Make	Universal Type and Make	REAR AXLE		BRAKES, Service and Emergency	
OPEN MODELS			CLOSED MODELS						Make and Model	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make				Ignition Make	Type and Make		Gear Ratio
2-3 Pass.	4-5 Pass.	6-7 Pass.	Sport Models	2-3 Pass.	4-5 Pass.	6-7 Pass.														
\$1950c	\$1785	\$1850	\$1885c	\$2250	\$2485		127	33x4 1/2	American.....D-66	H-S. 11000	6-3 1/2 x 5 1/2	29.40	Strom...	G-D....	A-K....	s-p B&B.	B & B...	m Hart...	F Salis...	4.50 R-R
.....	1195	1395c	1495	d1795p	114	32x4	Anderson.....41	Cont...6 Y	6-3 1/2 x 4 1/4	23.44	Zenith.	West...	West...	s-p B&B.	Durston.	f Univ.	1/2 F Salis	4.75 R-R
1495	1495	1595	1785b	1995c	1995d	122	32x4	Anderson.....Series 50	Cont...8 R	6-3 1/2 x 4 1/2	27.34	Rayfield.	Remy...	Remy...	s-p B&B.	Durston.	f Univ.	1/2 F Salis	1.62 R-R
.....	1915c	132	33x4	Anderson.....Series 50	Cont...8 R	6-3 1/2 x 4 1/2	27.34	Rayfield.	Remy...	Remy...	s-p B&B.	Durston.	f Univ.	1/2 F Salis	4.62 R-R
.....	1535	.....	.....	2200	.....	120	32x4	Apperson.....6	Own.....	6-3 1/2 x 4 1/4	23.44	Strom...	Remy...	Remy...	s-p Rock.	Mech...	m Thie...	1/2 F Col.	5.10 R-R
.....	2800	2900	.....	3750	\$3850	130	33x5	Apperson.....8-23-S	Own.....	8-3 1/2 x 5	33.80	Johnson.	Bijur...	Remy...	m-d Own.	Own...	m Thie...	1/2 F Own	4.25 R-R
.....	1095	.....	1325d	1495c	1595	114	31x4	Auburn.....6-43	Cont...6 Y	6-3 1/2 x 4 1/4	23.44	Strom...	Remy...	Remy...	s-p B&B.	Warner.	m Detr.	1/2 F Col.	4.60 R-R
.....	1595	.....	1850d	.....	2345	122	32x4 1/2	Auburn.....6-63	Own.....	6-3 1/2 x 5	25.35	Strom...	Remy...	Remy...	s-p B&B.	Warner.	m Thie...	1/2 F Col.	4.60 R-R
.....	1395	.....	1495d	1850	2250p	118	32x4	Barley.....	Cont...6 Y	6-3 1/2 x 4 1/2	23.44	Strom...	Delco...	Delco...	s-p B&B.	Fuller...	f M&E.	1/2 F Col.	5.10 R-R
935	965	.....	803g	1395c	1495	109	31x4	Buick.....1924	Own.....	4-3 3/4 x 4 1/2	18.23	Marvel.	Delco...	Delco...	m-d Own.	Own...	m Own.	1/2 F Own	4.66 R-R
1275	1295	.....	1135g	1995c	1695	123	32x4	Buick.....1924	Own.....	6-3 1/2 x 4 1/2	27.34	Marvel.	Delco...	Delco...	m-d Own.	Own...	m Own.	1/2 F Own	1.10 R-R
1385g	.....	1565	1675a	.....	2235f	128	33x4 1/2	Buick.....1924	Own.....	6-3 1/2 x 4 1/2	27.34	Marvel.	Delco...	Delco...	m-d Own.	Own...	m Own.	F Own	4.70 R-R
2885	2885	2885	3075c	3950	4300f	132	33x5	Cadillac.....61	Own.....	8-3 1/2 x 5 1/2	31.25	Own...	Delco...	Delco...	m-d Own.	Own...	m Spicer	F Tim	Opt. R-R	
.....	.....	.....	3750	3990	.....	122	32x4 1/2	Case.....X	Cont...8 R	6-3 1/2 x 4 1/2	27.34	Rayfield.	Delco...	Delco...	m-d Own.	Own...	f Sneed.	1/2 F Col.	5.00 R-R
1750	1790	.....	2230d	2480c	2575	129	33x5	Case.....Y	Cont...9 T	6-3 1/2 x 5 1/4	31.54	Rayfield.	Delco...	Delco...	m-d Own.	Own...	f Sneed.	1/2 F Col.	4.00 R-R
.....	1185	.....	1335d	1535	.....	117	32x4	Chalmers.....1923	Own.....	6-3 1/2 x 4 1/2	25.35	Strom...	A-L....	Remy...	m-d Own.	Own...	m Hardy	1/2 F Ad.	5.13 R-R
1595	1485	1645	1785c	1785	2185	123	32x4	Chalmers.....1923	Own.....	6-3 1/2 x 4 1/2	25.35	Strom...	A-L....	Remy...	m-d Own.	Own...	m Hardy	1/2 F Ad.	5.13 R-R	
.....	1085	.....	.....	12270	2595g	103	30x3 1/2	Chandler.....Six	Own.....	6-3 1/2 x 5	29.40	Strom...	Bosch...	Bosch...	s-p B&B.	Own...	f Own	F Own	4.45 R-R
510	525	425g	.....	680	850	103	30x3 1/2	Chevrolet.....Superior	Own.....	4-3 1/4 x 4	21.76	Zenith.	Remy...	Remy...	e Own.	Own...	m Own.	1/2 F Own	3.77 R-R
1085	995	.....	1095d	1195	1295	112 1/2	31x4	Cleveland.....42	Own.....	6-3 1/2 x 4 1/2	22.50	Strom...	Bosch...	Bosch...	s-p B&B.	Own...	m Mech.	1/2 F Own	4.90 R-R
.....	2175	2175	12600	1195d	1595p	127 1/2	33x5	Cole.....Master	Nort.M309	8-3 1/2 x 4 1/2	39.20	Johnson.	Delco...	Delco...	m-d Nort.	Nort...	m Spicer	F Col.	4.70 R-R	
.....	1475	.....	1925c	1995	.....	115	32x4	Columbia.....Big Six	Cont...8 R	6-3 1/2 x 4 1/2	27.34	Strom...	A-L....	A-K....	s-p B&B.	Durston.	m Spicer	1/2 F Tim	4.75 R-R
935c	1095	.....	1395d	1295	1495	115	31x4	Columbia.....Light Six	Cont...6 Y	6-3 1/2 x 4 1/2	23.44	Strom...	A-L....	A-L....	s-p B&B.	Durston.	m Spicer	1/2 F Tim	5.10 R-R
.....	1250	.....	1195	1595	.....	116	32x4	Courier.....	Falle. 8000	6-3 1/2 x 4 1/2	23.44	Strom...	West...	A-K....	s-p B&B.	Muncie.	f Flex.	1/2 F Col.	5.10 R-R
1395p	1295	.....	1595c	1495	2195p	116	32x4	Courier.....	Falle. 8000	6-3 1/2 x 4 1/2	23.44	Strom...	West...	A-K....	s-p B&B.	Muncie.	f Flex.	1/2 F Col.	5.10 R-R
.....	3100	31.0	.....	4500	.....	138	33x4 1/2	Crawford.....23-6-70	Cont...6 T	6-3 1/2 x 5 1/4	31.54	Zenith.	West...	Bosch.	m-d B-L.	B-L....	m Spicer	1/2 F Tim	..... R-R
.....	.....	.....	3500c	4500	.....	138	33x5	Crawford-Dagmar-6-70	Cont...6 T	6-3 1/2 x 5 1/4	31.54	Zenith.	West...	Bosch.	m-d B-L.	B-L....	m Spicer	1/2 F Tim	..... R-R
.....	5893	6300	.....	7650	.....	142	33x5	Cunningham.....V4	Own.....	8-3 1/2 x 5	45.00	Strom...	Delco...	Delco...	m-d Own.	Own...	f Sneed.	1/2 F Tim	4.23 R-R
5000	4650	4700	4650c	6350	6450	132	33x5	Daniels.....23-38	Own.....	8-3 1/2 x 5 1/4	39.20	Zenith.	Delco...	Delco...	m-d Own.	Own...	m Spicer	F Tim	4.23 R-R	
.....	5030	5150	6000c	6900	6900	132	33x5	Daniels.....23-38	Own.....	8-3 1/2 x 5 1/4	39.20	Zenith.	Delco...	Delco...	m-d Own.	Own...	m Spicer	F Tim	4.23 R-R	
1295	1.95	.....	1495c	1595	1795c	115	31x4	Davis.....71	Cont...7 U	6-3 1/2 x 4 1/2	23.44	Strom...	Delco...	Delco...	s-p B&B.	Warner.	m M&E.	1/2 F Tim	5.10 R-R
1895	1895	.....	1695d	2005	.....	120	32x4 1/2	Davis.....63	Cont...8 R	6-3 1/2 x 4 1/2	27.34	Strom...	Delco...	Delco...	s-p B&B.	Warner.	m Peters	1/2 F Tim	5.15 R-R
850	880	.....	730g	1035	1255	116	32x4	Dodge Brothers.....	Own.....	4-3 3/4 x 4 1/2	24.03	Stewart.	N.E....	N.E....	m-d Own.	Own...	m Own.	1/2 F Own	1.16 R-R
.....	3950	3950	4150c	4985c	5550	136	33x5	Dorris.....6-80	Own.....	6-4 x 5	38.40	Strom...	West...	Bosch.	m-d Own.	Warner.	m Spicer	1/2 F Tim	4.23 R-R	
870	885	.....	995c	1240	1350	108	31x4	Dort.....23-18	Lyc..KB	4-3 1/2 x 5	19.60	Carter.	Bosch.	Conn...	m-d Det.	Own...	m Mech.	1/2 F Fl.	4.66 R-R
1010	1025	.....	1135c	1355	1465	115	31x4	Dort.....25-20	Falls T8000	8-3 1/2 x 4 1/2	23.44	Carter.	Bosch.	Bosch.	m-d Det.	Own...	m Mech.	1/2 F Fl.	4.66 R-R
6750	5500	5900	5750c	7250	7500	134	33x5	Duesenberg Straight 8	Own.....	8-2 1/2 x 5	26.45	Strom...	Delco...	Delco...	s-p Own.	Own...	f Cll.	1/2 F Own	4.45 R-R	
850	890	.....	1065d	1365	1465	109	31x4	Durant.....A-22	Cont..Spec	4-3 3/4 x 4 1/2	24.03	Till...	A-L....	A-L....	s-p Own.	Warner.	m Spicer	1/2 F Ad.	4.33 R-R
1600	1650	.....	2250	2100	.....	123 1/2	32x4 1/2	Durant.....B-22	Anst...D	6-3 1/4 x 4 1/2	25.35	Rayfield.	A-L....	A-L....	s-p Anst.	Warner.	m f Spi	1/2 F Tim	5.15 R-R
1485	1095	.....	1275d	1395c	1595	112	32x4	Earl.....40	Own.....	4-3 1/2 x 5 1/4	18.91	Sece...	A-L....	Conn...	s-p B&B.	Own...	f Own.	1/2 F Own	4.87 R-R
.....	995	.....	1135	1425	.....	112	31x4	Elcar.....4-40	Lyc...K	4-3 1/2 x 5	21.03	Strom...	Delco...	Delco...	s-p B&B.	Warner.	m Peters	1/2 F Salis	4.50 R-R
1395	1395	.....	1595d	1975	1995	118	32x4	Elcar.....6-60	Cont..7 R	6-3 1/2 x 4 1/2	27.34	Strom...	Delco...	Delco...	m-d War.	Warner.	m Spicer	1/2 F Salis	4.50 R-R
.....	1045	.....	1145	1145	.....	108 1/2	32x4	Essex.....	Own.....	4-3 1/2 x 5	18.23	Own...	Bosch.	Bosch.	m-d Own.	Own...	m Spicer	1/2 F Own	4.66 R-R
1195	1195	.....	1195	1895c	1985	120	32x4 1/2	Flint.....	Cont..Spec	6-3 1/2 x 5	27.34	Strom...	DeJon...	DeJon...	s-p Own.	Warner.	m Spicer	1/2 F Ad.	4.66 R-R
269	298	235g	.....	530	595	100	30x3 1/2	Ford.....T	Own.....	4-3 1/2 x 4	22.50	Own...	Own...	Own...	m-d Own.	Warner.	m Own.	1/2 F Own	3.68 R-R
2975	2975	.....	3975	3975	.....	132	32x4 1/2	Fox.....Air-Cooled	Own.....	6-3 1/2 x 5	27.34	Zenith.	West...	Scintilla	m-d B-L.	B-L....	m Spicer	1/2 F Tim	4.90 R-R
.....	1950	.....	2750c	2250	\$2950d	115	32x4	Franklin.....10	Own.....	6-3 1/2 x 4	25.35	Own...	A-K....	A-K....	s-p B&B.	Own...	m Spicer	1/2 F Own	4.73 R-R
995	995	.....	1145c	1145	1445	112	32x4	Gardner.....Series 5	Lyc..CE	4-3 1/2 x 5	21.76	Zenith.	West...	West...	s-p B&B.	Mech...	m Peters	1/2 F Fl.	4.80 R-R
490	520	.....	750	835	.....	100	30x3 1/2	Gardner.....Series 5	Own.....	4-3 1/2 x 4	21.03	Sece...	West...	West...	s-p Own.	Own...	m Mech.	1/2 F Tim	3.90 R-R
2250	2250	.....	2853d	2600	.....	120	32x4 1/2	H.C.S.....Series 4	Weil...	4-3 1/2 x 5 1/2	22.50	Strom...	Delco...	Delco...	m-d B-L.	B-L....	m Spicer	1/2 F Own	4.63 R-R
1350	2050	.....	1350d	1750	.....	126	32x4 1/2	H.C.S.....Series 6	Midw...	6-3 1/2 x 5	29.40	Strom...	Delco...	Delco...	m-d B-L.	B-L....	m Spicer	1/2 F Own	4.36 R-R
.....	2150	.....	.....	.....	.....	115	32x4 1/2	Handley.....6-40	Falls T8000	6-3 1/2 x 4 1/2	23.44	Strom...	Bosch.	Bosch.	m-d Mech.	Mech...	m Mech.	1/2 F Tim	..... R-R
1395	1395	.....	1495c	2195	.....	125	32x4 1/2	Handley.....6-60	Midw...	6-3 1/2 x 5	27.34	Strom...	Bosch.	Bosch.	m-d Mech.	Mech...	m Mech.	1/2 F Tim	4.90 R-R
.....	1345	1345c	.....	1950	1950	115	32 x 4	Hanson.....66	Cont..8 R	6-3 1/2 x 4 1/2	27.31	Marvel.	Delco...	Delco...	s-p B&B.	G-L....	m Univ.	F Tim	4.66 R-R
1925c	1775	1795	1975d	2175	2275	121	32x4	Hatfield.....A-42	H-S. 7000	4-3 1/2 x 5	19.60	Zenith.	Dyneto	Conn...	s-p B&B.	G-L....	m Spicer	1/2 F Col.	4.66 R-R	



\$1895

f.o.b. factory

**The
Coachbilt Sport Sedan**

COACHBILT Anderson Aluminum Body; 6-cylinder Red Seal Continental Motor; Westinghouse Starting, Lighting and Ignition; Borg & Beck Clutch; 5 Steel Disc Wheels with 5 Cord Tires and Tire Cover; Luggage Trunk on rear fitted with 2 Suit Cases; Bumpers and Snubbers, front and

rear; German Silver Radiator Shell; Dome and Reading Lights; Vanity Case and Smoking Set; Heater; Sun Shade; Foot Dimmer for Headlights; Color—Gray with black fenders and black upper body; Wheelbase—115 inches; averages 19 miles per gallon of gasoline.

Other models: Touring Car \$1195; Sport Touring Car \$1445; Coach \$1495; Sedan \$1695, f. o. b. factory.

Ask about the Anderson direct-with-factory contract with maximum discount.

Anderson Motor Company, Rock Hill, S. C.

The Coachbilt
ANDERSON
ALUMINUM SIX

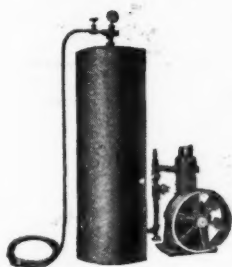
Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES						Wheel Base (Ins.)	Tire Size (Ins.)	NAME AND MODEL	ENGINE				ELECTRICAL SYSTEM		Clutch: Type and Make	Gearset Make	Universal: Type and Make	REAR AXLE		BRAKES, Service and Emergency	
OPEN MODELS			CLOSED MODELS						Make and Model	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make	Ignition Make				Type and Make	Gear Ratio		
2-3 Pass.	4-5 Pass.	6-7 Pass.	Sport Models	2-3 Pass.	4-5 Pass.																6-7 Pass.
\$2385	\$1835	\$2385	\$2385	.....	3375	3075	124	32x4 1/2	Kissel.....45	Own.....	6-3 1/2x5 1/2	26.38	Strom...	Remy...	Remy...	m-d War...	Warner...	m Spicer	F Own	3.92	R-R
5000	5300	5000	4200	.....	6300	6500	132	33x5	LaFayette.....	Own.....	8-3 1/2x5 1/2	33.80	Johnson...	Deleo...	Deleo...	m-d Own...	Own...	m Own...	F Own	1.58	R-R
1795	1795	1795	2145	.....	2345	2345	123	32x4 1/2	Lexington.....23	Own.....	6-3 1/2x5 1/2	25.35	Rayfield...	G-D...	Conn...	m-d Own...	Warner...	f Sneed	F Own	5.10	R-T
1575	1395	.....	1575	.....	2095	2645	117	32x4	Liberty.....10-D	Own.....	6-3 1/2x5 1/2	23.44	Strom...	Wagner	Wagner	s-p B&B...	Detroit...	m Spicer	1/2 F Tim	4.80	R-T
3800	3800	3800	.....	.....	4600	4900	136	33x5	Lincoln.....	Own.....	8-3 1/2x5 1/2	36.45	Strom...	Deleo...	Deleo...	m-d Own...	Own...	m Spicer	F Tim	4.58	R-R
8900	9500	9600	.....	.....	11750	11600	142	35x5	Locomobile...Series 8	Own.....	6-4 1/2x5 1/2	48.60	Ball&B...	West...	Deleo...	m-d Own...	Own...	m Own...	F Own	3.85	R-R
3385	3185	3185	.....	.....	4385	4385	136	32x4 1/2	Marmon.....34	Own.....	6-3 1/2x5 1/2	33.75	Strom...	Deleo...	Deleo...	m-d Own...	Own...	m Spicer	1/2 F Own	4.10	R-R
795	795	p96d	875b	935	.....	1135	109	31x4	Maxwell.....	Own.....	4-3 1/2x1 1/2	21.03	Stewart...	Remy...	Remy...	e Own...	Own...	f Own...	1/2 F Own	4.60	R-T
5400	5600	5700	.....	.....	6690	6810	110	33x5	McFarlan.....1923	Own.....	6-4 1/2x6	48.60	Rayfield...	West...	West...	m-d M&E...	B-L...	m Peters	F Tim	3.75	R-R
3950b	3950	3950	3950	4700	.....	5250	132	32x4 1/2	Mercer.....Series 5	Own.....	4-3 1/2x6 1/2	22.50	Ball&B...	West...	Eisem...	m-d Own...	Own...	m Spicer	F Own	3.87	R-R
1295	1295	3750	3750	1495	1585	5000	132	32x4 1/2	Mercer.....6	Own.....	6-3 1/2x5 1/2	33.75	Strom...	West...	Eisem...	m-d Own...	Own...	m Spicer	1/2 F Tim	3.77	R-R
.....	1785	.....	1995	2585	.....	5000	115	31x4	Moon.....6-40	Cont...6 Y	6-3 1/2x4 1/2	23.44	Strom...	Deleo...	Deleo...	s-p B&B...	Warner...	m Spicer	1/2 F Tim	5.10	R-T
.....	.....	.....	1995	2485	.....	5000	128	32x4 1/2	Moon.....6-58	Cont...8 R	6-3 1/2x4 1/2	27.34	Strom...	Deleo...	Deleo...	s-p B&B...	B-L...	m Spicer	1/2 F Tim	5.09	R-R
1240	1240	1615	.....	.....	2090	2190	121	33x4	Nash.....691-3-6-7	Own.....	6-3 1/2x5 1/2	25.35	Marvel...	Deleo...	Deleo...	s-p B&B...	Own...	m Own...	1/2 F Own	4.50	R-T
915	935	.....	1195	1445	.....	2190	127	34x4 1/2	Nash.....692-4-5-8	Own.....	6-3 1/2x5 1/2	25.35	Marvel...	Deleo...	Deleo...	s-p B&B...	Own...	m Own...	1/2 F Own	4.90	R-T
2175	2475	2375	2485	.....	3250	3285	130	32x4 1/2	National.....BB	Own.....	6-3 1/2x5 1/2	29.40	Rayfield...	West...	Deleo...	s-p B&B...	B-L...	m Univ.	F Col.	4.08	R-R
2500	2500	2600	.....	.....	3725	3500	128	38x5	Noma.....4C	Cont...8 R	6-3 1/2x4 1/2	27.34	Zenith...	Deleo...	Deleo...	s-p B&B...	Detroit...	m Spicer	1/2 F Tim	1.45	R-R
975	995	795	1105	1185	.....	1115	115	32x4	Oakland.....6-44	Own.....	6-2 1/2x4 1/2	18.99	Marvel...	Remy...	Remy...	e Own...	Muncie...	m Meech	F Own	1.70	R-R
975	975	.....	1145	1145	.....	1195	115	32x4	Oldsmobile.....43 A	Own.....	4-3 1/2x5 1/2	21.86	Zenith...	Deleo...	Deleo...	s-p B&B...	Muncie...	m Own...	1/2 F Own	1.70	R-R
1025	1375	1735	1675	1875	.....	2635	122	33x4 1/2	Oldsmobile.....46	Own.....	8-27 1/2x4 1/2	26.45	Ball&B...	Deleo...	Deleo...	e Own...	Muncie...	m Spicer	F Own	1.93	R-R
525	525	.....	425	795	.....	860	115	32x4	Oldsmobile.....47	Own.....	8-27 1/2x4 1/2	26.45	Johnson...	Deleo...	Deleo...	s-p B&B...	Muncie...	m Spicer	1/2 F Own	5.10	R-R
.....	750	.....	.....	.....	.....	.....	100	30x3 1/2	Overland.....91	Own.....	4-3 1/2x4 1/2	19.60	Till...	A-L...	A-L...	s-p B&B...	Own...	m Own...	1/2 F Own	1.50	R-R
.....	.....	.....	.....	.....	.....	.....	106	30x3 1/2	Overland.....92	Own.....	4-3 1/2x4 1/2	19.60	Till...	A-L...	A-L...	s-p B&B...	Own...	m Own...	1/2 F Own	1.50	R-R
2485	2185	.....	2650	3175	.....	3350	126	33x4 1/2	Packard.....126	Own.....	6-3 1/2x5 1/2	27.34	Own...	A-K...	Deleo...	m-d Own...	Own...	m Spicer	1/2 F Own	1.66	R-R
3850	3650	.....	4550	4725	.....	4700	133	33x1 1/2	Packard.....133	Own.....	6-3 1/2x5 1/2	27.34	Own...	A-K...	Deleo...	m-d Own...	Own...	m Spicer	1/2 F Own	1.66	R-R
2695	245	245	.....	.....	4900	4950	136	33x5	Packard "Eight".....136	Own.....	8-3 1/2x5 1/2	36.45	Own...	Dyneto...	Dyneto...	m-d Own...	Own...	m Spicer	1/2 F Own	1.70	R-R
.....	.....	.....	.....	.....	3235	3235	143	33x5	Packard "Eight".....143	Own.....	8-3 1/2x5 1/2	36.45	Own...	Dyneto...	Dyneto...	m-d Own...	Own...	m Spicer	1/2 F Own	1.70	R-R
1550	1390	1425	1165	2395	.....	3435	131	33x4 1/2	Paige.....6-70	Own.....	6-3 1/2x5 1/2	33.75	Rayfield...	Remy...	A-K...	m-d Long...	Warner...	m Meech	1/2 F Tim	4.00	R-R
3300	2990	2990	3300	3400	.....	4090	120	32x4 1/2	Paterson.....23-6-52	Cont...8 R	6-3 1/2x5 1/2	27.34	Strom...	Deleo...	Deleo...	s-p B&B...	Durston...	m Hart...	1/2 F Salis	1.50	R-R
5250	5250	5250	6800	6900	.....	7000	128	33x5	Peerless.....23	Own.....	8-3 1/2x5 1/2	33.80	Ball&B...	Deleo...	Deleo...	m-d Own...	Own...	m Spicer	1/2 F Tim	1.90	R-R
2535	1695	1745	1745	2145	.....	3385	138	33x5	Pierce-Arrow.....	Own.....	6-4 x5 1/2	38.40	Own...	Deleo...	Deleo...	m-d Own...	Own...	m Spicer	1/2 F Own	4.25	R-R
.....	2535	2585	2635	3385	.....	3935	126	32x4 1/2	Pilot.....	H-S... 90	6-3 1/2x5 1/2	25.35	Till...	Wagner	Wagner	s-p Hoos...	Muncie...	m Blood	1/2 F Col.	1.67	R-R
2850	2900	2950	3500	3700	.....	3700	126 1/2	32x4 1/2	Premier.....6-D	Own.....	6-3 1/2x5 1/2	27.34	Strom...	Deleo...	Deleo...	s-p B&B...	Muncie...	m Spicer	1/2 F Col.	1.58	R-R
1335	1335	1545	.....	.....	1885	2185	120	32x4	R & V Knight.....II	Own.....	6-3 1/2x5 1/2	29.40	Strom...	A-L...	A-L...	s-p B-L...	B-L...	m Spicer	1/2 F Tim	5.40	R-R
3200	3200	3200	3200	3200	.....	1835	120	32x4	Reo.....76	Own.....	6-3 1/2x5 1/2	24.34	Rayfield...	N.E...	N.E...	m-d Own...	Own...	m Own...	1/2 F Own	1.70	R-R
1485	1485	.....	1885	1985	.....	2185	131	32x4 1/2	Revere.....M	Dues...	6-4 1/2x5 1/2	30.63	Strom...	West...	Bosch...	m-d B-L...	B-L...	m Spicer	1/2 F Std	3.4	R-R
1635	1635	.....	2035	2135	.....	2135	117	32x4	Rickenbacker.....B	Own.....	6-3 1/2x5 1/2	23.44	Strom...	Bosch...	Bosch...	s-p B&B...	Warner...	m Meech	1/2 F Col.	1.63	R-T
2685	2485	2685	2750	3285	.....	3585	128	32x4 1/2	Ric enbacher.....B	Own.....	6-3 1/2x5 1/2	23.44	Strom...	Bosch...	Bosch...	s-p Own...	Warner...	m Mech.	1/2 F Col.	1.63	R-T
3685	3485	3800	3650	.....	3955	3585	128	32x4 1/2	Roamer.....6-51-E	Cont.12XD	6-3 1/2x5 1/2	29.40	Strom...	West...	Split...	s-p B&B...	G-L...	f Sneed	1/2 F Tim	1.60	R-R
10900	10900	10950	.....	.....	4250	3950	138	32x4 1/2	Roamer.....6-54-E	Cont.12XD	6-3 1/2x5 1/2	29.40	Strom...	West...	Split...	s-p B&B...	G-L...	f Sneed	1/2 F Tim	1.60	R-R
.....	.....	.....	.....	.....	4650	.....	128	32x4 1/2	Roamer.....4-75-E	Roach...	4-4 1/2x5	28.90	Strom...	West...	Split...	s-p B&B...	B-L...	f Sneed	1/2 F Tim	1.60	R-R
1015	1615	.....	2015	2615	.....	3500	143 1/2	33x5	Rolls-Royce.....40-50	Own.....	6-4 1/2x5 1/2	48.60	Own...	Bijur...	Bosch...	e Own...	Own...	m Own...	F Own	3.76	R-R
875	875	.....	.....	.....	5100	5200	118	32x4	Rubay.....	Own.....	4-2 1/2x5 1/2	12.10	Strom...	Bosch...	Bosch...	s-p Own...	Own...	m Univ.	F Own	5.10	R-R
985	985	.....	.....	.....	5250	5250	118	33x4	Sayers Six.....DP	Cont...8 R	6-3 1/2x5 1/2	27.34	Strom...	Deleo...	Deleo...	s-p B&B...	G-L...	m Arvae	1/2 F Std	1.75	R-R
.....	.....	.....	.....	.....	13500	12900	108	30x3 1/2	Seneca.....L-2 & O-2	Cont...8 R	4-3 1/2x5 1/2	19.60	Zenith...	A-L...	A-L...	s-p B&B...	G-L...	m Univ.	F Peru	1.75	R-R
2750	2750	2750	2425	3585	.....	3985	112	31x4	Seneca.....50c & 51c	Cont...8 R	4-3 1/2x5 1/2	21.03	Zenith...	A-L...	A-L...	s-p B&B...	G-L...	m Univ.	F Peru	1.50	R-R
319	319	285	530	645	.....	3300	127	34x4 1/2	Standard.....99	Own.....	8-3 1/2x5 1/2	33.80	Zenith...	West...	Split...	s-p B&B...	G-L...	m Arvae	1/2 F Tim	1.45	R-R
2250	2250	2450	2275	3150	.....	3450	127	34x4 1/2	Stanley.....740	Own.....	2-4 x5	None...	Bijur...	None...	None...	None...	None...	m Spicer	1/2 F Own	1.50	R-R
2700	2700	2850	2700	3350	.....	3700	102	30x3 1/2	Stearns-Knight...SKL4	Cont. Spec	4-3 1/2x5 1/2	15.63	Till...	A-L...	A-L...	s-p Own...	Warner...	m Spicer	1/2 F Tim	1.87	R-R
1445	1395	1745	2145	3300	.....	3400	125	32x4 1/2	Stearns-Knight.....6	Own.....	6-3 1/2x5 1/2	22.50	Rayfield...	West...	A-K...	m-d Own...	Own...	f Chi...	1/2 F Col.	1.90	R-R
2750	2750	2850	2700	3350	.....	3700	130	34x4 1/2	Stephens.....10	Own.....	6-3 1/2x4 1/2	25.35	Strom...	Deleo...	Deleo...	s-p B&B...	Mech...	m Meech	1/2 F Own	1.70	R-R
319	319	285	530	645	.....	3300	127	34x4 1/2	Stephens.....20	Own.....	6-3 1/2x4 1/2	25.35									



Satisfied Customers Are Regular Ones



Style "S"

Single Stage Outfit.
Belted only. 5 sizes
1-4 to 3 H. P.

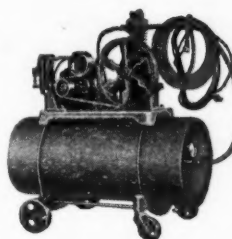
THE MOTORIST (your customer) expects dependable free air service. If you have no air compressor or if you have one that is out of order half of the time—you are surely losing business. Most people don't kick—they just go elsewhere, where they know they can get real service. That's why you should use great care in the purchase of an air compressor—why you should select a Curtis—one that will render dependable service and will

not drive your patrons elsewhere in disgust.

Curtis Outfits are the result of 69 years manufacturing experience, 29 of which have been devoted to manufacturing pneumatic machinery. They are correct in design—are made in our own 17½ acre plant from the very best raw materials. They are original in design—embodying many exclusive features that assure long life and minimum upkeep.

Many Styles and Sizes

We manufacture a complete line of single and two-stage, air and water cooled compressors—stationary and portable. There is a style, size and arrangement to suit your particular needs. Use the coupon for full information.

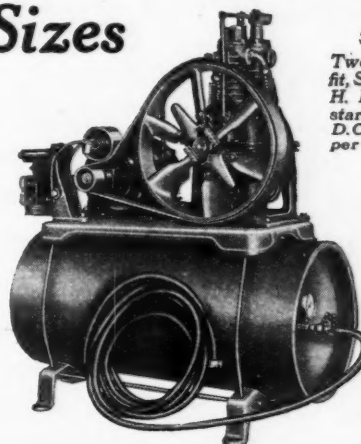


Style "X"

Portable Outfit. Belted
or geared. 5 sizes. A. C.
or D. C. Motor.

CURTIS
PNEUMATIC MACHINERY CO.
1527 Kienlen Ave., St. Louis, Mo. U. S. A.

Branch Office:
530-H Hudson Terminal, New York City



Style "V"

Two-stage Outfit,
Sizes 3-4 to 2
H. P. Automatic
starter. A. C. or
D. C. Motor. Copper
Intercooler.

Send
Coupon

CURTIS *Single and*
Two Stage
Air Compressors

Curtis
Pneumatic
Machinery Co.
1527 Kienlen Avenue
St. Louis, Mo.

Gentlemen:

Please send me full details on
Curtis Air Compressors, your
proposition and prices.

Name.....

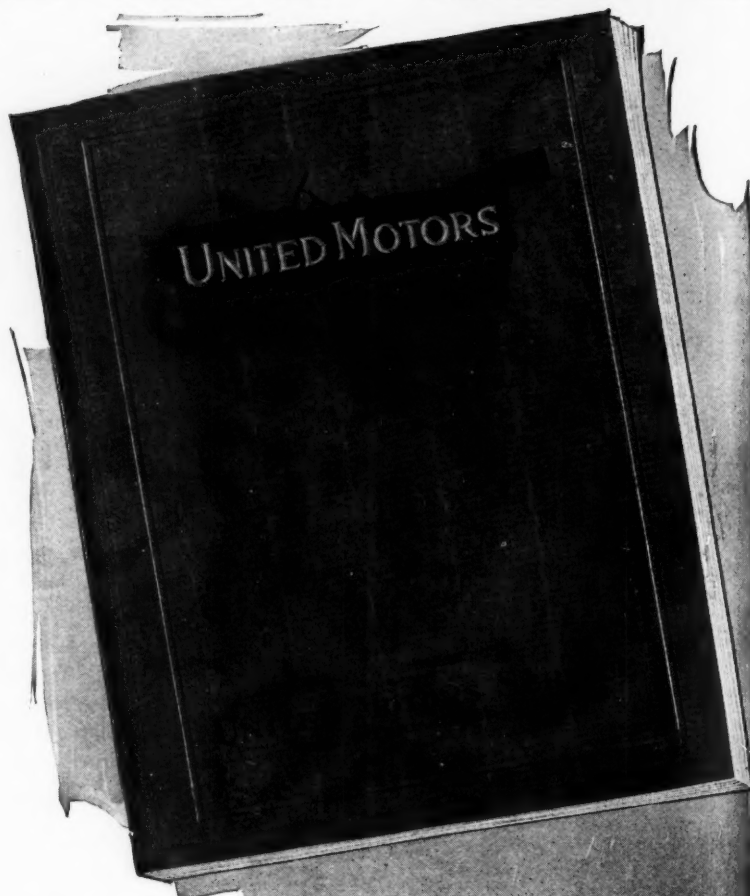
Address.....

Jobber's Name.....

Address.....

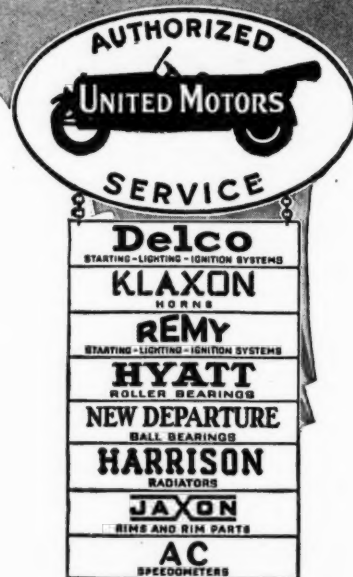
HERE IT IS!

A PRACTICAL ELECTRICAL SERVICE BOOK



Send for Your Copy Today

IF you service electrical equipments you can't do without this handy book on Delco, Klaxon, and Remy. In it you will find the names and numbers of repair parts—illustrations to identify them—a handy index to find them—and charts by make of car to guide you. You will use it every day—in fact you will wonder how you ever got along without this handy, compact Service Book. It is free. Write for it on your business stationery or enclose your business card. The edition is limited—get your copy today. Write to Department W.



UNITED MOTORS SERVICE

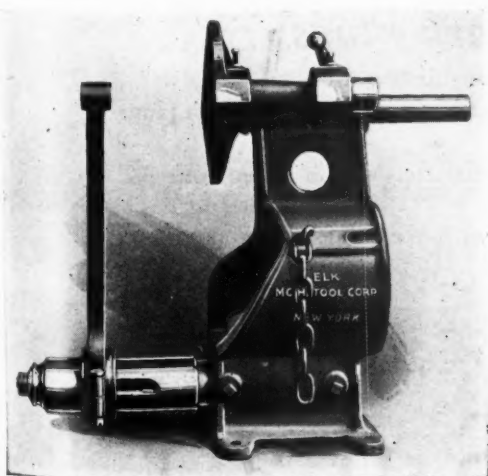
General Offices: **INCORPORATED** Detroit, Michigan

USE THE NEW ELK MACHINE TOOL

Stop Scraping Motor Bearings By Hand

It is slow and inaccurate also costly.
The Elk Machine will Shave and
Burnish the Bearings to
100% Bearing Contact Surface
All done in 15 Minutes to a Bearing

Removes Wrist Pins
Align-Reams Wrist Pin Bushings
Squares Wrist Pins and Pistons
to a perfect Fit and Accuracy



**ELK MACHINE TOOL
CORPORATION**

243 WEST 17TH ST.
NEW YORK., U.S.A.

*READY TO ESTABLISH
DISTRIBUTING AGENCIES*

A Profit-Making System—

Here are the details of an accessory selling system that gets profits:

Salesmen are instructed to sell accessories with every car.

A list of accessories is included in the car contract for the guidance of car salesmen so that no sales opportunities will be overlooked.

Suggested List of Accessories to Be Included in Car Contract

Spare tire	Spotlight
Motometer	Windshield cleaner
Rear view mirror	Kit of lamp bulbs
Bumpers	Kit of AC Spark Plugs
Stop signal	Tire pressure gage

A commission is paid car salesmen on their accessory sales. This gets their cooperation in selling this equipment.

Commissions are also paid to the clerks in

the accessory store or department, and to men in the garage who handle customers.

Every car entering the garage is checked over to find out what accessories are needed to complete its equipment. An effort is then made to sell the needed accessories.

Advantage is taken of display, manufacturers' selling helps and of the national advertising on products carried in stock.

A kit of AC plugs is sold with every car delivered.

This system is making profits for many dealers. It will make profits for any dealer who will adapt it to his business.

Dealers can get the biggest profits from this system by concentrating their selling efforts on the leader in each field. The opposite page proves why AC is the recognized leader in the spark plug field.



The AC Spark Plug Kit to carry spare plugs

The opposite page proves why AC is the leader in the spark plug field

Why Motorists Should Carry Spare Spark Plugs

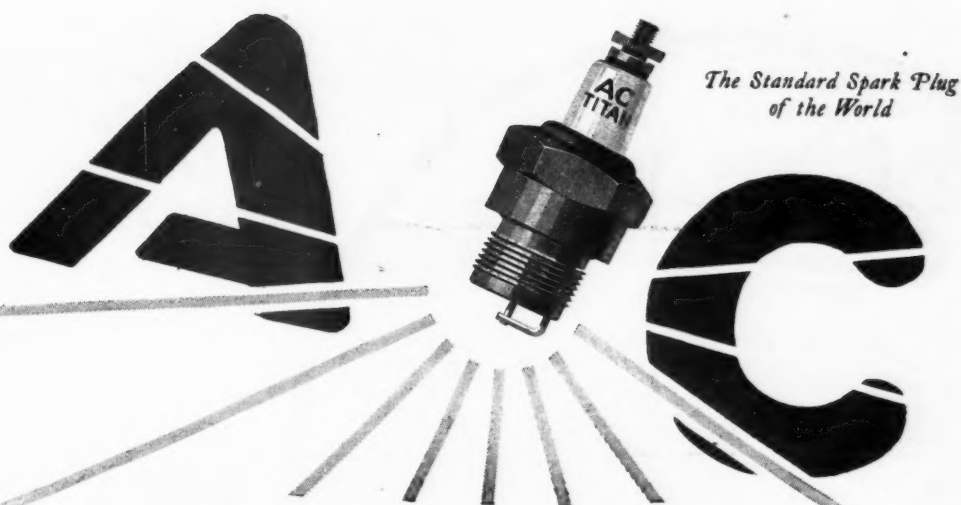
Spare spark plugs are insurance against trouble.

The AC Plug Kit makes it possible to carry spare spark plugs without damage.

This kit is furnished the motorist free with a set of four AC Spark Plugs.

The kits cost you nothing. Ask your Jobber's salesman about them.

S e l l A C S p a r k



Think of all the CHEVROLETS—they have always been AC-equipped.

- all the BUICKS—AC-equipped for fifteen years.*
- all the DODGE BROTHERS—have never used anything but AC.*
- all the NASH cars—always AC-equipped.*
- OAKLANDS—for the past fifteen years AC-equipped.*
- all the OVERLANDS—AC-equipped for years.*
- all the WILLEYS-KNIGHTS—AC-equipped for years.*
- all the DURANTS—have never used anything but AC.*
- all the STARS—always AC-equipped.*
- all the HUDSONS—AC-equipped for the past ten years.*
- all the ESSEX cars—have never used anything but AC.*
- all the MAXWELLS—AC-equipped for years.*
- all the CHALMERS—AC-equipped for years.*
- all the PAIGE cars—for the past eight years AC-equipped.*
- all the JEWETTS—always AC-equipped*
- OLDSMOBILE—AC-equipped for the past fifteen years.*
- HUPMOBILE—for the past ten years AC-equipped.*
- CADILLAC—AC-equipped for the past ten years.*
- all the CHANDLERS—AC-equipped for the past nine years.*

AND MORE THAN TWO HUNDRED OTHERS — all AC-equipped and already in use in your locality. This tremendous ready-made market for AC's is right at your door and will always be there in ever-increasing size. Each day the demand for AC's grows bigger.

Read on the following page about AC

1075 *Special for Fords*, which gives you an opportunity to take first place in the enormous Ford plug replacement business.

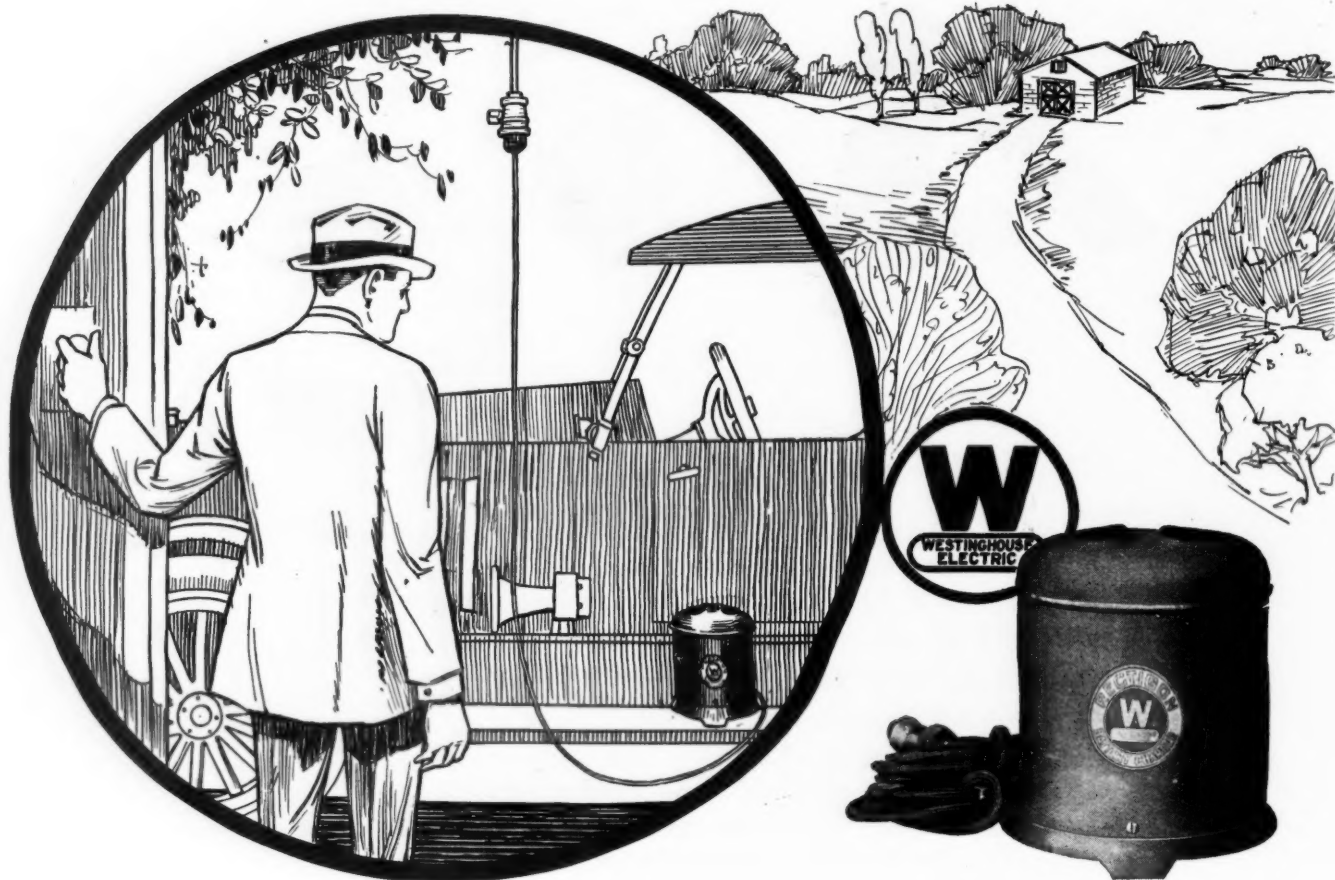
There's an AC plug for every motor—you need not tie up money in other brands, but concentrate on AC's, the easiest selling, most profitable and best known quality plug.

AC Spark Plug Company, FLINT, Michigan

Makers of AC Spark Plugs—AC Speedometers

U. S. Pat. No. 1,135,727, April 13, 1915, U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending

Plugs by the Kit



Sells Easily

because it is so useful, so practical—this little Rectigon Battery Charger.

Tell the motorist about the convenience of re-charging the battery over night.

Show him how convenient it is to use—how light and portable.

Screw the plug into a light socket before retiring and in the morning the battery will be full of life,—as easy to connect as an electric iron.

The Rectigon Battery Charger is carefully made—and *well* made. It has no moving parts to get out of order or re-

quire adjustment. It will last as long as the car.

Then, who is the man who doesn't have a radio set today. Here is another selling appeal, because the Rectigon is ideal for re-charging the radio storage battery.

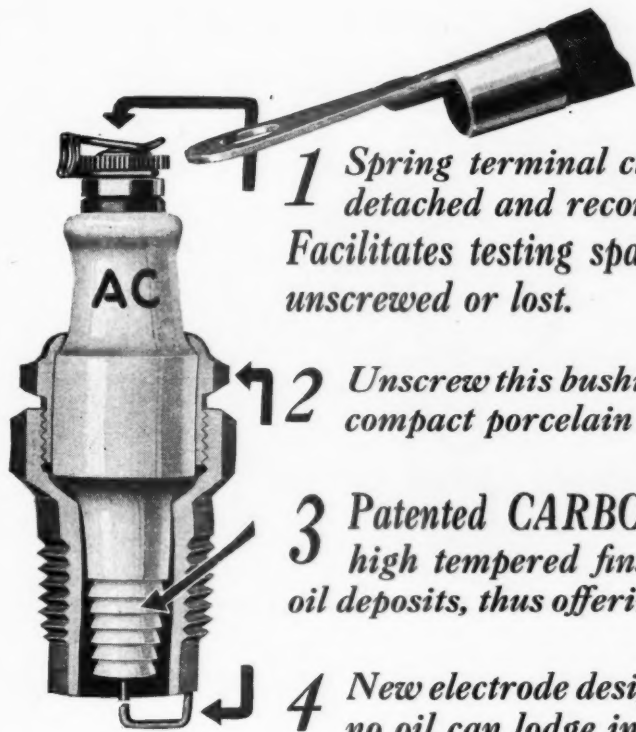
Rectigon dealers are making neat profits—and their sales are increasing, because they are selling a real, useful article, bearing the trademark of a reliable manufacturer.

Write us today.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
EAST PITTSBURGH PENNSYLVANIA

Westinghouse

There are good reasons why this plug sells for a trifle more than ordinary plugs—and here they are:



1 Spring terminal clip permits wire to be instantly detached and reconnected while motor is running. Facilitates testing spark plug and coil. No nut to be unscrewed or lost.

2 Unscrew this bushing and plug comes apart. Notice compact porcelain to withstand hard service.

3 Patented CARBON PROOF porcelain with its high tempered fins attains sufficient heat to burn oil deposits, thus offering effective resistance to carbon.

4 New electrode design forms a natural drain so that no oil can lodge in spark gap.

Ford owners everywhere know AC's reputation as a spark plug maker. They know that AC's have been proved best in open competition between racing cars, speed boats and airplanes.

National advertising is showing Ford owners the many features of the AC 1075, which make it a better plug for Ford engines.



The AC Plug Kit—to carry spare plugs

The AC Plug Kit is something the motorist has always wanted to carry his spare plugs. It helps you make four sales instead of one. It is just one more thing that makes AC's easier to sell and consequently gives you a better profit.

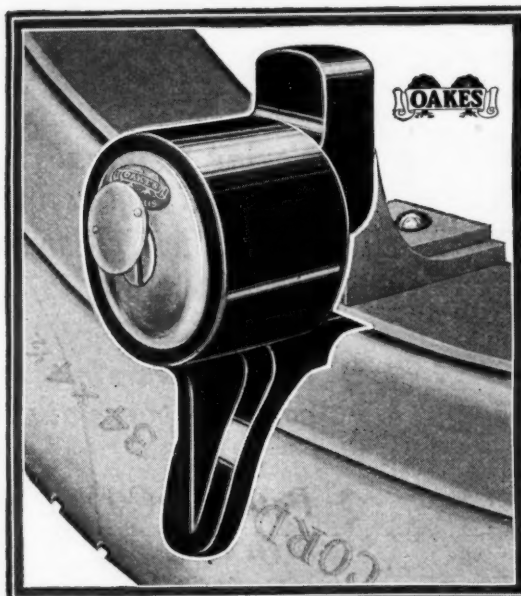


AC Spark Plug Company, FLINT, Michigan

Makers of AC Spark Plugs—AC Speedometers

U. S. Pat. No. 1,135,727, April 13, 1915, U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending

OAKES Spare Tire LOCK



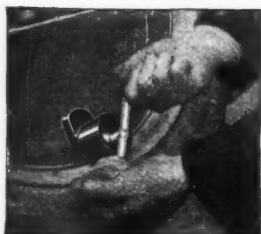
See how easily
it is installed:



Unscrew nut from stud with rim wrench, and remove wedge.



Slip Oakes lock housing over stud. Replace nut on stud inside housing.



Tighten nut with rim wrench. Be sure nut is on tight.



Snap lock unit in end of housing. No need to use key.

Put on in a minute

Easy to sell with a new car or spare tire

YOU can install an Oakes Spare Tire Lock on a customer's car in a minute. Just remove the regular nut and wedge, slip the lock housing over the stud, replace and tighten the nut, and snap the lock unit in end of housing. The four illustrations at the left show how easily it is done.

It's just as easy for the car owner to take off, when he wants to use his spare tire. No dusty, clumsy chains, cables or straps to remove. No rusty padlocks to fuss with. A quarter turn of the key releases the lock unit, a few turns of the rim wrench unscrew the nut, the lock housing lifts off and the tire is free.

Ease of operation is only one of many reasons why motorists prefer this lock. Its neat design, attractive finish, positive protection, and freedom from rattling, are other strong points of appeal.

You can sell this lock to every customer who buys a car or spare tire. Show him how easily it operates, how safely it guards his tire, how neat and smart it looks—and you'll make a quick sale and a nice profit. It retails at \$5.00 (Ford type \$4.00). Send for a sample lock and trade discounts.

For spare disc wheels we make the Oakes Spare Wheel Lock. Ask for full details.

*Oakes Spare Tire and Spare Wheel Locks are
Standard Equipment on 19 Makes of Cars.*

THE OAKES COMPANY, Est. 1910. Indianapolis, Ind.

Distributors of Oakes Locks:

- | | |
|---|---|
| BOSTON—Hartford Shock Absorber Agency,
319 Columbus Avenue. | NEWARK—Hartford Auto Products Company,
177 Central Avenue. |
| BUFFALO—D & W Sales Co., 1471 Main Street. | NEW YORK—E. R. Waterman, 117 W. 63rd St. |
| CHICAGO—Automotive Specialty Company,
23rd and Indiana Avenue. | OMAHA—A. M. Walsh, 2008 Harney Street. |
| CINCINNATI—Holmes and Curl Company,
1131 Race Street. | PHILADELPHIA—R. S. Sayer, 818 N. Broad St. |
| DETROIT—Rex Sales Co., 320 Piquette Ave. | PITTSBURGH—Axwell Equipment Company,
240 Second Ave. and 280 Moorewood Ave. |
| INDIANAPOLIS—Lilly Hardware Company,
114-118 East Washington Street. | RENO, NEV.—M. R. Sloan, P. O. Box 471. |
| LOS ANGELES—Charles L. Mead Company,
1313 South Figueroa Street. | ROCHESTER, N. Y.—D & W Sales Company,
261 Central Avenue. |
| MILWAUKEE—Western Motor Supply Co.,
434 Jefferson Street. | SAN FRANCISCO—Albert B. Pennington,
819 David Hewes Building. |
| MINNEAPOLIS—Auto Lock Sales Company,
1124 Hennepin Avenue. | SEATTLE—The Ernst Tire Co., 1122 Pine Street. |
| | ST. LOUIS—Noser Sales Co., 2016 Locust Street. |
| | WASHINGTON, D. C.—Standard Automot-
tive Supply Company, 1720 14th Street, N. W. |



Look
for the
BALL POINT
HAMMER
MARKS
inside the
ring

During the past eleven years practically all the important automotive and industrial engine builders in the United States have approved and installed American Hammered Piston Rings

American
Hammered
Piston Rings

Motor Car Manufacturers

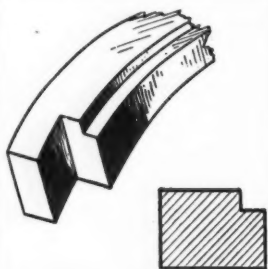
who have used

American *Hammered* Piston Rings as factory equipment:

Apperson	Fifth Avenue Coach	Peerless
Available Truck	Fox Motor Car Co.	Pierce-Arrow
Buick	Garford Trucks	Ranier Trucks
Cadillac	Kelly-Springfield	Rochester Motors
Canadian Buick	Gramm-Bernstein	Schacht Trucks
Canadian Chevrolet	Haynes	Scripps Booth
Chalmers	Hudson	Sterling Trucks
Chandler	Hupmobile	Studebaker
Chevrolet	Locomobile	Stutz
Cleveland Tractor	Maxwell	Velie
Coates Steamer	Mercer	Waldenn Shaw
Columbia	Metz	White
Curtis Airplane	Nash	Wilcox Trucks
Daniels	Ner-a-Car	Wills St. Claire
Defiance Motor Truck	Oakland	Willys-Overland
Dodge	Oldsmobile	Winton
Dorris	Packard	Wright Airplanes
Federal Trucks	Paige Detroit	Yellow Cab

In addition to the above manufacturers are many motor builders such as

Hercules Motors	Turner & Moore Motors
Hinkley Motors	Supreme
Herschell-Spillman Co.	Waukesha Motors
Northway Motors	Weidley Motors



THE OIL GROOVE

This ring is used in cylinders which are slightly out of round.

The same List Price as all other American *Hammered* Piston Rings.

50c and up.

These motors are distributed to approximately one hundred manufacturers who are using them in different makes of assembled cars.

This list is not complete as we supply an equally large number of manufacturers of pumps, compressors, industrial engines and steam engines.

**American
Hammered
Piston Rings**

Look
for the
BALL POINT
HAMMER
MARKS
inside the
ring

Distributors and Their Branches Carrying Stocks of American Hammered Piston Rings

Albany Hardware & Iron Company	Albany, N. Y.	Hoof & Company, J. C.	Chicago, Ill.
Alexander-Seewald Company	Atlanta, Ga.	Horton-Gallo-Creamer Company	New Haven, Conn.
American Motor Equipment Company	Boston, Mass.	Hutchison & Company, T. T.	Wheeling, W. Va.
American Sales Company	Baltimore, Md.	Inter-Mountain Electric Company	Salt Lake City, Utah
Andrae & Sons Company, Julius	Milwaukee, Wis.		Pocatello, Idaho
Auto Supply Company, Inc.	Nashville, Tenn.	Interstate Hardware Company	Bristol, Va.-Tenn.
Automobile Piston Company	Memphis, Tenn.	Jackson, W. E. & W. H.	San Francisco, Cal.
Automobile Supply Company, The	Chicago, Ill.	Johnson Tire & Auto Company	Montgomery, Ala.
Ayers Farmer Auto Supply Company	St. Joseph, Mo.	Johnstown Automobile Company, The	Johnstown, Pa.
Bailey Co., The James	Portland, Me.	Justus & Parker Company, The	Columbus, Ohio
Bailey-Lobby Company, The	Charleston, S. C.	Kansas City Automobile Supply Co.	Kansas City, Mo.
Bailou & Wright	Portland, Ore.	Kelley-Hew-Thomson Company	Duluth, Minn.
Bailou & Wright	San Francisco, Cal.	Kimball-Upton Company	Sacramento, Cal.
Baker, Hamilton & Pacific Company	Cincinnati, Ohio	Ko-Mo Supply Company	Charlotte, N. C.
Bantlin Company, Julius J.	Washington, D. C.	Lansing Brothers, Inc.	Seranton, Pa.
Barber & Ross	Joliet, Ill.	Lowe Motor Supplies Company, Inc.	New York, N. Y.
Barrett Hardware Co.	Allentown, Pa.	M. & M. Company, The	Cleveland, Ohio
Bea Automobile Company	Providence, R. I.	" " " "	Akron, Ohio
Belcher & Loomis Hardware Company	Louisville, Ky.	" " " "	Youngstown, Ohio
Belknap Hdw. & Mfg. Co.	Richmond, Va.	Mackenzie, White & Dunsmuir, Ltd.	Vancouver, B. C.
Benton-Bailey Co., Inc.	Boise, Idaho	Martin-Evans Company	Brooklyn, N. Y.
Bertram Motor Supply Co.	El Paso, Texas	Meadows-Price Company, Inc.	Roanoke, Va.
Borderland Auto Supply Company	Bangor, Me.	Mersick & Company, The C. S.	New Haven, Conn.
Bragg & Sons, N. H.	Grand Rapids, Mich.	Michigan Automotive Supply Company	Detroit, Mich.
Brown & Schler Company	Sioux Falls, S. D.	Miller Hardware Company, C. H.	Huntingdon, Pa.
Brownell Corporation, The	Stockton, Calif.	Minneapolis Iron Store Company	Minneapolis, Minn.
California Auto Supply Co.	Charleston, S. C.	Montana Hardware Company	Butte, Mont.
Cameron & Bartley Company	Canton, Ohio	Moore-Handley Hardware Company	Birmingham, Ala.
Canton Hardware Company	Columbia, S. C.	Morley-Murphy Hdw. Company	Green Bay, Wis.
Carolina Tire & Accessory Company	Cedar Rapids, Iowa	Motor Equipment Company	Wichita, Kansas
Cedar Rapids Pump & Supply Company	San Francisco, Cal.	Motor Hardware & Equipment Co.	San Diego, Cal.
Chandler & Lyon Company	Fresno, Cal.	Motor Mercantile Company	Salt Lake City, Utah
" " " "	Oakland, Cal.	Motor Supply Company	Chattanooga, Tenn.
" " " "	Seattle, Wash.	Myers, Harper P.	York, Pa.
" " " "	Spokane, Wash.	McClung & Company, C. M.	Knoxville, Tenn.
" " " "	Eau Claire, Wis.	McCoy Motor Supply Company	San Francisco, Cal.
Clemons Auto Supply Company	Jacksonville, Fla.	McCullough & Son, J. H.	Los Angeles, Cal.
Consolidated Grocery Company	Cincinnati, Ohio	McGowan-Lyons Hdw. & Supply	Philadelphia, Pa.
Cooper Rubber Co., The J. J.	Columbus, Ohio	McLennon Hardware Co.	Mobile, Ala.
" " " "	Dayton, Ohio	Nichols, Dean & Gregg	Waco, Texas
" " " "	Indianapolis, Ind.	Norris & Sons, R. W.	St. Paul, Minn.
" " " "	Knoxville, Tenn.	Northwestern Auto Supply Co., Inc.	Baltimore, Md.
" " " "	Nashville, Tenn.	Odell Hardware Company	Billings, Mont.
Couden Co., O. W.	Little Rock, Ark.	Olmsted Company, Inc., The	Greensboro, N. C.
Crow-Burlingame Company	Flint, Mich.	Patrick's, Inc.	Syracuse, N. Y.
Cummings Brothers	Peoria, Ill.	Peaslee-Gaulbert Company, Inc.	Jacksonville, Fla.
Cummings & Emerson	Shreveport, La.	Pekau Company, E. A.	Louisville, Ky.
Cupples-Loneragan Company, Inc.	Auburn, Me.	Pittsburgh Auto Equipment Company	Omaha, Neb.
Darling Automobile Company	New York, N. Y.	Pruden Hardware Company, W. E.	Pittsburgh, Pa.
Dienst Co., Inc., A. P.	Canton, Ohio	" " " "	Newark, N. J.
Dine-DeWes Company, The	San Francisco, Cal.	Rawson-Upshaw Company	Atlanta, Ga.
Dunham, Carrigan & Hayden Co.	Hastings, Neb.	Reinhard Brothers Company, Inc.	Minneapolis, Minn.
Dutton & Sons Company, W. M.	Pittsburgh, Pa.	Ruber & Son, W. H.	Rochester, N. Y.
Dyke Motor Supply Company	Newark, N. J.	Russell Hardware Company, Inc.	Washington, D. C.
Economy Auto Supply Company	Dallas, Texas	Severin Tire & Supply Company	McAlester, Okla.
Electric Appliance Company	San Francisco, Cal.	Severin & Company	Oklahoma City, Okla.
" " " "	Elmira, N. Y.	Shadbolt & Boyd Iron Company	Tulsa, Okla.
Elmira Arms Company	Hartford, Conn.	Simmons Hardware Company	Milwaukee, Wis.
Emmons-Hawkins Hardware Company	Los Angeles, Cal.	" " " "	St. Louis, Mo.
Ensworth & Son, L. L.	Bluefield, W. Va.	" " " "	Philadelphia, Pa.
Farrar-Brown Co., Inc., The	Fort Smith, Ark.	" " " "	Wichita, Kan.
Featherstone, E. A.	Fort Wayne, Ind.	Silgo Iron Store Company	St. Louis, Mo.
Flat Top Supply Co. (Br. Van Zandt-Leftwich)	Charleston, S. C.	Sorber-Kuhn Auto Supply Co.	Joplin, Mo.
Fort Smith Automotive Supply Co.	Harrisburg, Pa.	Southern Auto Supply Company	Chattanooga, Tenn.
Fort Wayne Iron Store Company	Lancaster, Pa.	Stadtler Auto Supply Company	Houston, Texas
Franko & Company, Inc., C. D.	York, Pa.	Standard Supply & Equipment Co.	Philadelphia, Pa.
Front Market Motor Supply Company	Altoona, Pa.	" " " "	Trenton, N. J.
Gaul, Deer & Shearer Company	Detroit, Mich.	Stauffer, Eshleman & Company, Ltd.	New Orleans, La.
General Automotive Supply Company	Springfield, Mass.	Straus-Frank Company	San Antonio, Texas
" " " "	Providence, R. I.	Strauss & Company, Inc., Joseph	Buffalo, N. Y.
General Motor Supply Company	South Bend, Ind.	Supplee-Biddle Hardware Company	Philadelphia, Pa.
General Sales Company	Salt Lake City, Mo.	Sweeney Electrical Company, The B. K.	Denver, Colo.
Godfrey, Duffley, Rolfe Company	Denver, Col.	Thomson-Diggs Company, The	Sacramento, Cal.
Goodby-Rankin Company	Des Moines, Iowa	Toledo Rubber Company	Toledo, Ohio
Good-Lin Automotive Company	Allentown, Pa.	Turner Auto Supply Company	Texarkana, Texas
Hausam Co., R. J.		United States Rubber Company	Chicago, Ill.
Hendrie & Bolthoff Mfg. & Supply Co.		" " " "	Boston, Mass.
Herring Motor Company		" " " "	Buffalo, N. Y.
Hersh Hardware Co., Inc., F.		" " " "	Des Moines, Iowa
		" " " "	Erie, Pa.
		" " " "	Milwaukee, Wis.
		" " " "	Omaha, Neb.
		" " " "	Rochester, N. Y.
		" " " "	Syracuse, N. Y.
		" " " "	Utica, N. Y.
		Utica Cycle & Supply Company	Utica, N. Y.
		Van Zandt-Leftwich Auto Supply Co.	Huntington, W. Va.
		Waterhouse & Lester	San Francisco, Cal.
		" " " "	Los Angeles, Cal.
		Weinstock Nichols Company	San Francisco, Cal.
		" " " "	Los Angeles, Cal.
		" " " "	Oakland, Cal.
		Western Motor Supply Co.	Minneapolis, Minn.
		Wetmore-Savage Company	Boston, Mass.
		" " " "	Springfield, Mass.
		Whittemore-Sim Co., Inc.	New York, N. Y.
		Williams Hardware Co.	Minneapolis, Minn.
		Wilson Hdw. Co., E. L.	Beaumont, Texas
		Wholesale Auto Supply House of Tampa	Tampa, Fla.
		Woodring & Company, Jere	Hazleton, Pa.
		Woodwell Company, Joseph	Pittsburgh, Pa.

**American
Hammered
Piston Rings**

Look
for the
BALL POINT
HAMMER
MARKS
inside the
ring

The carefully built reputation of the dealer or garageman may be ruined through installing inferior products. It happens regularly.

Can you afford to gamble with your reputation?

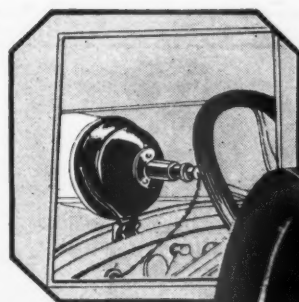
The American *Hammered* Piston Rings have been *universally* approved, and the opinion of the country as a whole is seldom wrong! There is a profit for you in our Service Station Agreement—write for it and our representative will call.

American *Hammered* Piston Rings

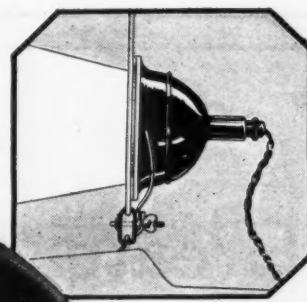


Look
for the
BALL POINT
HAMMER
MARKS
inside the
ring

AMERICAN HAMMERED PISTON RING COMPANY, Baltimore, Maryland—Export Department, 461 Eighth Avenue, New York, U.S.A.



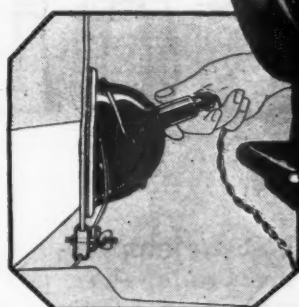
EASY TO REACH



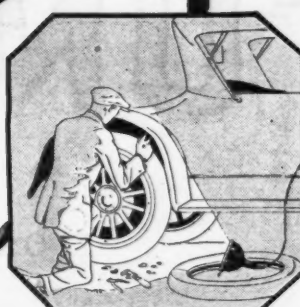
NO GLASS TO CUT

Price
\$8.50
 in black enamel
 \$10.00 in nickel

*There is only one
 genuine INSHIELD
 Spotlight.
 Beware of imitations.*



MOVES IN ANY DIRECTION



AN EVER-HANDY TROUBLE LAMP



Announcing A New Lower Priced Model

A new world of sales opportunity is opened to the accessory dealer by this lower priced model of the universally popular Inshield Spotlight.

NO GLASS TO CUT—NO SPECIAL TOOLS NECESSARY

THIS new model Inshield retails at \$8.50. It is identical in every way with the \$10.00 Inshield except that it is finished in baked-on black enamel instead of nickel. It is made in one size only, 4½" in diameter. Fits all cars. The Inshield remains today the outstanding leader in the Spotlight field. Easily attached, no glass to cut, no spe-

cial tools needed, a powerful beam, works at all angles, beautifully finished in two models, nickel and black enamel, durably made, it is a life time light for any car. The nickel model comes in two sizes, the Senior 5½" in diameter and the Junior 4½" in diameter. The Black Enamel is made in the Junior size only.

The low priced model now makes the distinctive and superior Inshield light completely acceptable to the greatest of all car markets—the low priced car field. We are now making deliveries. Leading jobbers everywhere have stocks. With a complete line of Inshields you can sell every car owner in your market.

Genuine Inshield Spotlight made only by

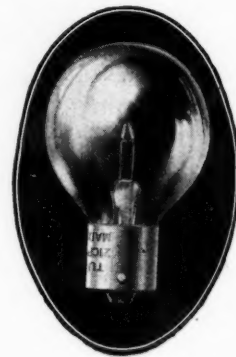
THE THAL & BITTER MACHINE CO., Inshield Division, TOLEDO, OHIO

INSHIELD SPOT LIGHT

Trade Mark Reg. U. S. Pat. Off.

INSIDE THE WINDSHIELD — NO GLASS TO CUT

Get Greater Profits
FROM
Your Bulb Business



TUNG-SOL

THE Quality of TUNG-SOL lamp bulbs is recognized throughout the Trade. The popularity of Tung-Sol plus an interesting sales policy, make *this* lamp an extremely profitable proposition for jobber, dealer and serviceman.

You can develop a larger lamp business and make it pay real dividends through TUNG-SOL. A letter to us will tell you why. Then there is the matter of service. With 16 National distributing points, we are in position to keep your stocks complete at all times. As the *largest* independent lamp manufacturer in the industry, we possess facilities for taking care of every lamp bulb requirement—no matter what it is.

JOBBER - DEALER - SERVICEMAN

Write for full particulars. Let us tell you how TUNG-SOL adds to profits and sales.

MINIATURE INCANDESCENT LAMP CORPORATION
Newark, New Jersey



Licensed Under General Electric Company's Incandescent Lamp Patents

Durable—Safe—Profitable

A Landslide

Orders are pouring in
for the wonderful new

BOSCH

Type 600 Ignition
for FORDS

All records have been broken!

The tremendous demand for the Bosch-Ford Ignition System has astounded the dealers—

Ford owners everywhere are having their cars equipped with Type 600, the big, dependable ignition system made by the manufacturers of the world famous Bosch Magneto.

There will be hundreds sold in your community this fall—some dealer is going to make big money!

Get the jump on the others—Wire TODAY for full particulars and a sample fitting C.O.D.

American Bosch Magneto Corporation

Main Office and Works: Springfield, Mass.

Branches: New York, Chicago, Detroit, San Francisco



What it Does

- 1—Makes Easy Starting.
- 2—Keeps Plugs Clean.
- 3—Prevents "Bucking."
- 4—Gives More Power.
- 5—Saves Gas and Repair Bills.
- 6—Stops Timer Troubles.
- 7—Pays for Itself.
- 8—Prevents Short Circuits.
- 9—Cuts Down Vibration.
- 10—Eliminates Spark Lever.

Your 1923 Opportunity

CLEVELAND

Announces

1924

MODELS

**Featuring a New, More
Powerful Motor and 16
Other Big Improvements**

Touring Car \$1045 5-Pass. Sedan \$1365

F. O. B. CLEVELAND

C L E V E L A N D

"MORE POWER," is and always has been the universal demand of the motorist.

"More power," has been the echo of that demand which dealers and distributors have passed along to the manufacturers.

So, when the 1924 Cleveland models were being planned we asked our dealers for suggestions.

"No changes," said many.

But some who knew the public demand, suggested greater power.

Fastest Selling Six

"You've always given us beauty, comfort, and durability," they said. "And ample power for fine, consistent performance. Right now we are competing with any and all of them. But give us more power and we'll make the Cleveland Six the fastest selling Six in the country—regardless of size or price!"

And that is what we have done in the 1924 Cleveland—more power than even the most enthusiastic dealer hoped to get!

Finest Motor of Size

The new motor of the 1924 Cleveland is, we honestly believe, the finest of its size ever placed in a motor car.

Smooth, supple, and economical, it develops without a trace of vibration such an enormous brute driving force that its magnificent performance in traffic and on hills inspires boundless enthusiasm. Every distributor who has been behind the wheel of the 1924

Cleveland has been thrilled. Every dealer who has driven it has pronounced it the finest performer he has ever handled.

Performance Supremacy

It has been pitted against dozens of bigger and more costly cars—against recently announced Sixes rating over 70 H. P. And the all around superiority it displayed over them all astonished even our own engineers. A fair comprehension of its power is impossible without a ride.

In themselves, the increased power, economy and flexibility of the new motor would make the 1924 Cleveland a car whose dominance of the light six field could not be challenged.

But we have given Cleveland dealers even *more than that!* We have enhanced the beauty of all *nine* models. We have increased the ease with which they operate. We have made them simpler for owners to take care of.

Low Prices

But best of all we have placed on them prices so low that Cleveland dealers can actually meet the price competition of four cylinder cars! Think what that means!

Obviously we cannot condense into this space the complete story of the 1924 Cleveland and what it offers to dealers. It is too big, too vital, too important. Every dealer should have it, regardless of where he is located or whether he is satisfied with his present connection. And if you write, that story will be placed before you without delay.

CLEVELAND AUTOMOBILE COMPANY

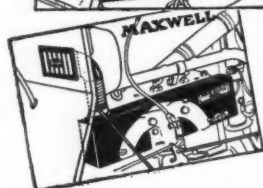
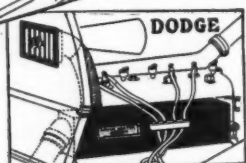
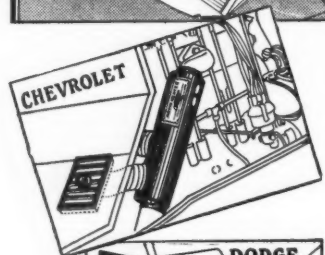
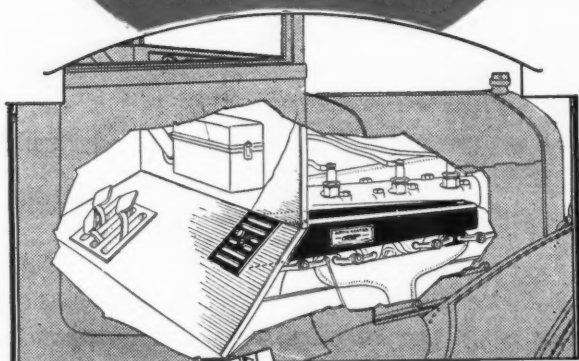
Export Department, 1819 Broadway, New York City

CLEVELAND

Cable Address "Cleveauto"

74%

of ALL Cars are Prospects



Retail Prices

FORD	-	\$1.75
West of Denver		\$1.90
In Canada		\$2.50
CHEVROLET		\$3.00
West of Denver		\$3.50
In Canada		\$4.50
DODGE	-	\$5.00
West of Denver		\$5.50
In Canada		\$7.50
MAXWELL	-	\$5.00
West of Denver		\$5.50
In Canada		\$7.50

THREE out of every four cars you see are possible—yes, probable—sales for the Arvin Heater DeLuxe. No other accessory appeals so strongly to so many car owners! Every one of them needs driving comfort—they will *be glad to buy* the Arvin.

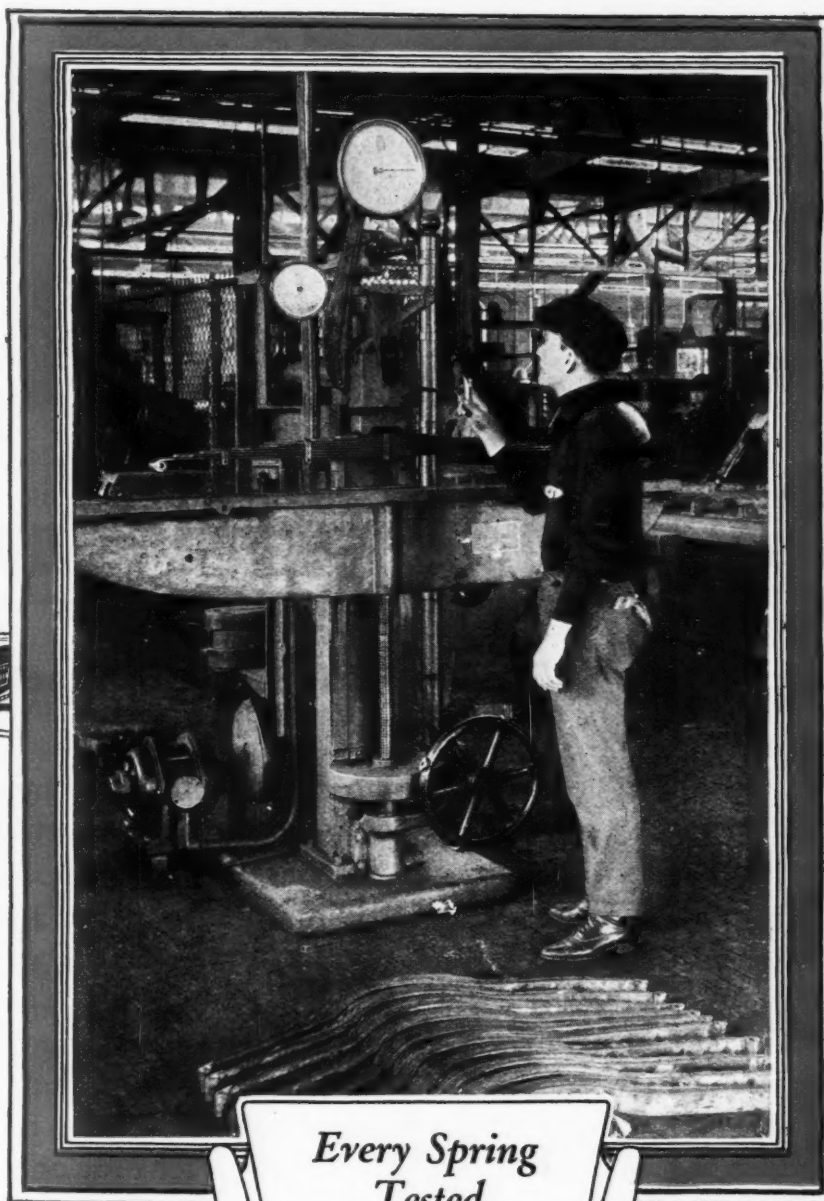
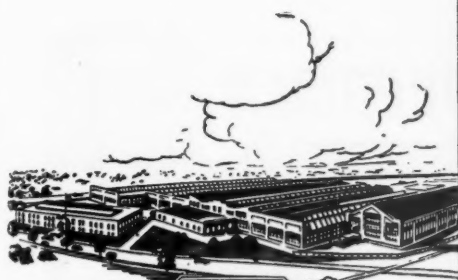
Watch for the first advertisement of the big Arvin Heater DeLuxe campaign in *The Saturday Evening Post*—appears next week. Car owners over the entire nation will read of Arvin Comfort. They will want to know where they can get this year-'round convenience at such an insignificant cost. It's up to you to tell them.

Send in your order for a case of 25 Arvins *now*. Have 'em ready to sell when the first frost makes car owners realize how unpleasant it is to drive in a cold, cheerless car. Special fall dating granted on early shipments. Order direct, specifying jobber, and tell us how soon you want us to deliver.



INDIANAPOLIS PUMP & TUBE CO.
1020 Drovers Street
INDIANAPOLIS

order NOW!



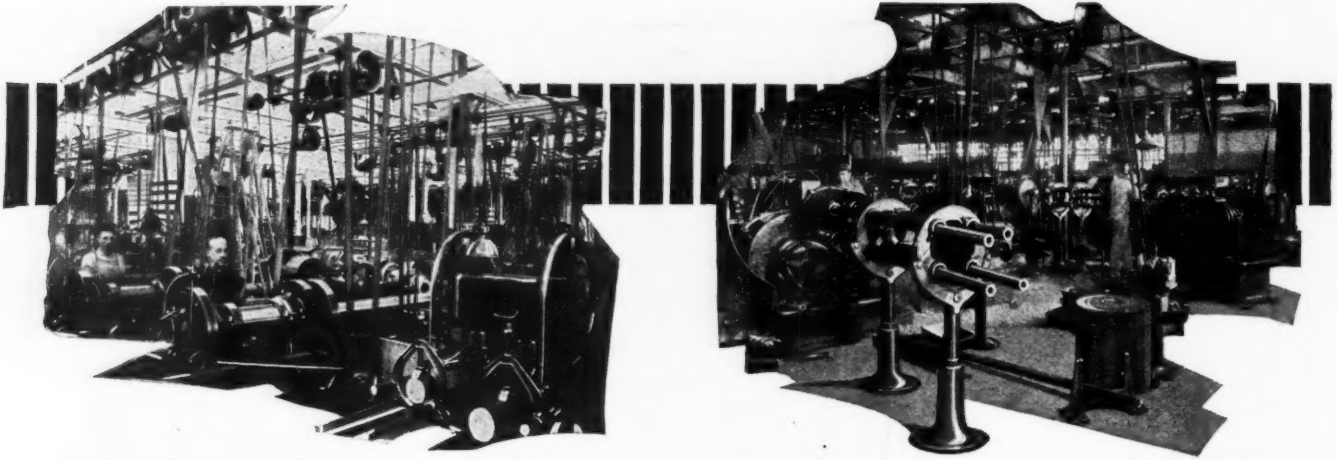
*Every Spring
Tested*

AMERICAN *Springs*

AMERICAN AUTOPARTS COMPANY

9775 FRENCH ROAD

DETROIT, MICHIGAN



Factors in **Strom** Supremacy

BALL BEARINGS



No. 5—Cutting Off Stock and Machining

To assure uniformity in ball-bearings successive operations must bear exact relation to each other. Precise co-ordination in this particular is attained at the STROM plant by automatic machines which cut, bore, face, and ream—without removal of the bar from its chuck. One more small cut, beveling the edge, and the ring is ready for the hardening room. This is another reason why STROM guaranteed ball-bearings, for new or replacement work, put winged feet on Power—

"Wherever a Shaft Turns"

(1979)



Strom

BALL BEARINGS

U. S. Ball Bearing Mfg. Co.
4531 Palmer St., Chicago

*An Organization
Built for Precision*

*Scientific in Principle
and Practice*

KINGSTON

The KINGSTON line for 1923 embraces not only the best but the handsomest carburetors that the world's largest carburetor factory has been able to produce in the quarter century of its existence. All of the Kingston De Luxe line carburetors are of brass construction, all are equipped with Kingston Steering Column Control, and with the new type compact brass fuel strainer. They are attractively boxed in special counter display cases in sets of three, and there is a big established demand awaiting the alert dealer. Write for particulars.

THE NEW FORD MODEL

The new all-brass Kingston for Fords, equipped with Steering Column Control and fuel strainer, is one of the big sellers of the season. Not only is the new model made of highly polished brass, but it is finished with utmost care in every detail. Thus the best Ford carburetor on the market becomes also the handsomest on the market. This model, with Steering Column Control attached, is shown in the illustration to the right.

Kingston De Luxe Models are made also for Maxwell, Chevrolet, Overland, Dort and Dodge at \$15; for Studebaker at \$16.50, Haynes at \$20.00, and many other popular priced car models are furnished.

The Kingston line can be had in special display boxes, three to the box, in any combination the dealer desires. Vigorous advertising co-operation is at the command of the dealer. Get in touch with us at once.

BYRNE, KINGSTON & COMPANY KOKOMO, INDIANA

BRANCHES

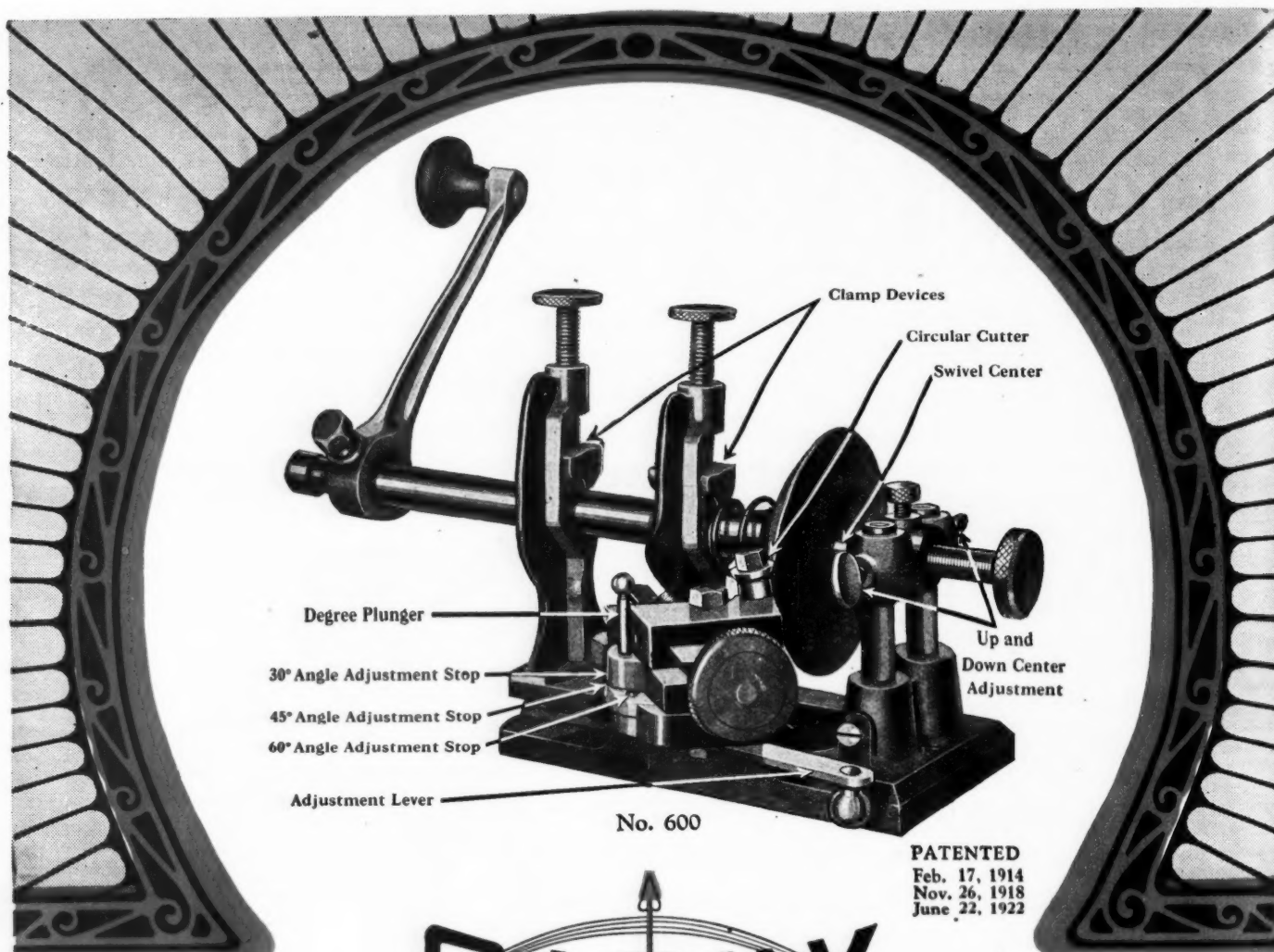
New York, 245 W. 55th St.
Detroit, 4610 Woodward Ave.

Chicago, 1430 Michigan Ave.
Dallas, 2218 S. Harwood St.



STEERING COLUMN CONTROL

The Kingston Steering Column Control, shown attached to the Ford De Luxe Model in the illustration above, is not a choke, but operates directly in connection with the needle valve, with a pull button operating through flexible steel tubing. The pull button is attached to the steering column just below the wheel, handy to the driver. It affords a full 90 degree operation of the needle valve, either for starting or in extreme road or weather conditions, is a splendid all the year around convenience, and saves time, temper, and fuel and motor wear. It is very easily installed, is a part of every De Luxe Kingston, and is a boon to the driver.



Refaces

All Valves

Either 30, 45 or 60° angles and from 1 $\frac{3}{8}$ " to 4 $\frac{1}{2}$ " in diameter.

Whatever his requirement in size or degree, the user of a "Sioux" Valve Lathe always expects and always receives exceptionally fine performance.

Get acquainted with "Sioux" Tools. It's the right step toward shop economy.

Sold by All Live Jobbers

Write for Catalogue and Valve Seat Reamer Specifications
ALBERTSON & CO. SIOUX CITY, IOWA

"The Well Equipped Shop Gets the Business"

SIoux VALVE LATHE



Here's Your Fastest Selling Winter Accessory!

The KINGSTON CAR HEATER will be your best seller this fall. A stock of these heaters will mean ready sales, a handsome profit and a host of pleased customers. This is a quality heater, an ornament to the car, selling at popular prices — a heater that has genuine "heatability." It is a heater you can fully and freely endorse.

Kingston Heater Advertising

Reproduced herewith in miniature is a full page in the Saturday Evening Post. This is to be followed by a number of smaller (one-fourth page) advertisements strongly urging the Heater as an ideal Christmas present. This vigorous consumer campaign will mean quick profits to dealers. Stock the complete line and be ready for the certain demand. Be sure that you get a complete supply of window displays, counter cards, circulars and other dealer aids.

Kingston Heaters have hosts of friends. Sales have more than doubled every year. Get your share of this good business.

A Heater with real "heatability"

Kokomo Electric Company
Kokomo, Indiana

KINGSTON

CAR HEATERS

REPU



I have been driving one of your RAPID TRANSIT trucks on the jitney line for the past six weeks. I am more than pleased with the results so far. It is very economical on gas and oil. I run from 150 to 200 miles every day. I buy on an average of ten to twelve gallons of gas and one quart of oil per day. I average twelve to fifteen passengers one way. I am especially pleased with the service and attention given me by the Norfolk Republic Truck Corp. who sold me the truck. I have been using another make of speed truck and bought the RAPID TRANSIT instead of another of the make I had. I firmly believe the Republic Rapid Transit is the best light speed truck in the business here, and I will be glad to advise anyone who wants real value to buy it.

W. P. SIMPSON
422 Grayden Ave., Norfolk, Va.



REPUBLIC

trucks

The Strength of National Use

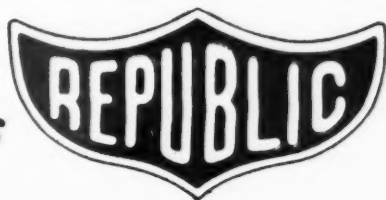
REPUBLIC TRUCKS will sell in your territory because they are selling in every kind of territory. Republic has more trucks in use than any other exclusive truck builder.

You know Republic trucks will suit all lines of business in your particular region, because their fitness is known and sought throughout the nation's commerce.

There is no escaping these broader, surer possibilities of a truck nationally known, nationally used, nationally serviced. And of all trucks built, only a handful of makes have a national market to give the local dealer the prestige, the concrete records, the broad renown of universal use!

Franchises for the few nationally marketed trucks are today at the greatest premium. Republic particularly is being recognized because of the complete Republic line, its unabated goodness, and the virile organization incorporating all of Republic experience.

REPUBLIC MOTOR TRUCK CO., ALMA, MICHIGAN
More Trucks in Use than any other Exclusive Truck Builder



Yellow Chassis

Transportation



Front Wheel Brakes for Practically all Makes of Cars

*Your customers want this protection.
An opportunity for live dealers.*

Any of these 10 Cars

Of any model may be
equipped with Front
Wheel Brake Axles.

BUICK
CADILLAC
CHANDLER
HUDSON
LINCOLN
PACKARD
PAIGE
PEERLESS
STUDEBAKER
STUTZ

*Also available for nearly all
other makes of cars.*

—to fill the motoring public's most insistent demand—Front Wheel Brakes for their old cars. Thousands of motorists everywhere who bought cars last year or the year before are regretting the fact that they haven't the better control of four wheel brakes. Cash in on this demand. U. S. Front Wheel Brake Axles are now available for practically all makes of cars. Their simplicity and efficiency will appeal to every motorist. U. S. Front Wheel Brake Axles are interchangeable with the old axles. This means easy installation.

One in your community will attract many. There is a real opportunity here for every live dealer. Write today for full particulars.

U.S.
FRONT WHEEL BRAKE
AXLES

U. S. AXLE CO., Pottstown, Pa.

Pioneer Builders of Front Wheel Brake Axles

Something for the Car for Christmas



MONOGRAM

The

ORIGINAL

Self Locking Radiator Cap

The Personal Gift

Cake was just cake until mother put candles on it.

The shield on Monogram Cap shows that the giver stopped to think about the receiver.

At Christmas people like to show they thought particularly about a friend. So that shield on Monogram Cap makes it especially suitable for Christmas giving. The receiver's initial or emblem makes Monogram Cap THE PERSONAL gift.

This year our plans for Christmas sales-promotion are much improved over the highly successful campaign of 1922. Any Monogram salesman or service inspector will explain them. Or write for them now. NOW because we were swamped last year, and may have to disappoint this year's late-comers.

GENERAL AUTOMOTIVE CORPORATION
600 West Jackson Boulevard
Chicago, Illinois



America's finest cars ever rolling along on

HYATT Quiet Roller Bearings

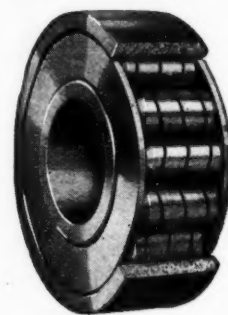
On busy street and crowded boulevard, they roll along in never ending procession—these fine motor vehicles, the product and pride of American genius and craftsmanship. And Hyatt roller bearings play an important part in the operation of all of them.

Manufacturers know that the quiet, trouble-free operation of these bearings remains entirely unaffected by continuous driving, the strain of constant stops and starts, and the jolts and jars of hardest going.

Therefore, as evidenced by the accompanying list, Hyatt roller bearings continue to be the choice of America's leading motor car builders.

HYATT ROLLER BEARING COMPANY
Newark Detroit Chicago San Francisco

Worcester Milwaukee Huntington, W. Va.
Minneapolis Philadelphia Cleveland
Pittsburgh Buffalo Indianapolis



Motor Cars

Auburn	Crow-Elkhart	Handley-Knight	Lincoln Locomobile	Packard-Eight
Bay State	Dixie Flier	Hayes-Taxicab	Marmon	Paige
Bell	Dodge	Haynes	Maxwell	Pierce-Arrow
Bradley	Dorris	Hudson	McLaughlin	Premier
Buick Four	Dort	Hupp	Meteor	Reo
Cadillac	Duesenberg	Jewett	Mitchell	Revere
Case	Earl	Jordan	National	Sayers 6
Chalmers	Essex	King	Oakland	Southern
Checker Taxi	Ferris	Kissel	Ogren	Standard
Chevrolet	Ford	Kline-Kar	Olds	Stearns
Cole	Franklin	La Fayette	Packard-Six	Stutz
Columbia	Gardner	Leon Rubay	Winton	
Comet	Gray-Dort	Lexington		
Courier				

Commercial Vehicles

Acason	Diamond-T	Highway	Miami Trailer	Service
Acme	Doane	Howe-Fire	Moreland	Signal
Ahrens Fox	Dodge	Huron	Mutual	Southern
American	D-Olt	Independent-Iowa	Nash	Standard
American Motor Bus	Dorris	Independent-Ohio	Napoleon	Sterling
Armleder	Driggs-Seabury	Indiana	Netco	Stewart
Atlas	Duplex	International Harvester	Niles	Stoughton
Atterbury	Eagle		Noble	Sullivan
Autocar	Eric		Norwalk	Super
Available	Fageol	Jumbo	Old Reliable	Thomart
Beck	Fargo	Kearns	Olympic	Tiffin
Bell-Iowa	Federal	Kelly-Springfield	Oneida	Titan
Belmont	Fifth Avenue Coach	Keystone	Oshkosh	Tower
Bessemer	Ford	Kimball	Paige	Traffic
Bethlehem	Four Wheel Drive	Kissel	Parker	Transport
Biederman	Freeman	Kliebery	Patriot	Triangle
B & R	Front Drive	Koehler	Pierce-Arrow	Truxton
Bridgeport	Fulton	K. Z.	Pittsburgher	Twin City
Brockway		Lange	Reliance	Union
Buffalo	Garford	Larabee	Reo	United
Chevrolet	Gary	L. M. C.	Riddle	U. S.
Chicago Truck	General Motors Truck	Lombard	Robinson	Veteran
Clydesdale	Gersix	Maccar	Rowe	Vim
Columbia	Graham Bros.	Mack	Ruggles	Ward-LaFrance
Comet	G. W. W.	Master	Samson	White
Commerce	Hahn	Maxwell	Sanford	Wichita
Corbitt	Hawkeye	McDonald	Schacht	Wilcox Trux
Day-Elder	Hendrickson	Menominee	Seagrave	Wilson
Defiance			Selden	Winther
Denby			Seneca	Wolverine

In the rare cases where replacements are necessary, Hyatt roller bearings can be readily obtained from the Branches and Authorized Bearings Distributors of United Motors Service or from the service stations of the car or truck manufacturers.



1 Out of Every 3 Car Dealers in Illinois "Went Broke" last year Why?

In Illinois last year there were 3,000 registered dealers in passenger cars. A year later 1,000 of these had gone out of business. Figures recently published show that only 17 out of every 100 automobile dealers make money. The other 83 just "get by."

The Class Journal Co., leading publishers and authorities on automotive statistics have just investigated this serious condition exhaustively. Here is what they find:

Profits on the sale of cars alone are too small. The used car situation is partly responsible. Too much of your profit is tied up in used cars each year. That is why 83 dealers in 100 "go broke" or just "get by"!

But how are the other 17 making real money? The investigation shows they are doing just one thing almost without exception—they are *pushing sidelines*. Accessories and service that they can sell at a good profit without tying up capital in used cars. They are more than car dealers. They are automotive merchants.

Here is a typical example cited. A car dealer in a town of 50,000 has yearly total sales of \$1,000,000. Half of his sales are accessories and service. And $\frac{2}{3}$ of his profits come from this half of his business. Furthermore, none of this profit is tied up in used cars. It's in the bank.

This dealer also finds his accessory business makes regular customers out of his car buyers. It is increasing his car sales.

This dealer is one of the 17.

Are you applying the same principles?

You can do it with Alemite sales and service.

Read what other dealers are doing with it.





Alemite Profits in Cash — Not Used Cars

Small Stock—Fast Turnover

The experience of other dealers shows you the big profits possible with Alemite Sales and Lubricating Service—profits in *cash*. With a lean, fast selling stock that gives you 5 to 10 or more profits per year on your investment.

One large automobile dealer writes as follows: "For the first six months of this year we have reached a sales total of around \$16,400. This is an increase of 250% over last year. As our investment is not over \$1,000, you can see that we turn our Alemite stock very rapidly.

The smaller dealers do as well proportionately. In an Illinois town of 19,000 a dealer averages \$40 per week net profit on lubricating service alone. In addition his Alemite sales give him gross profits of \$60 to \$100 per month, on an *investment* of less than \$350.

Another man who makes a specialty of lubricating service has averaged \$200 per week since January 1st. A Leavenworth, Kansas, dealer says his profits average \$66 a week on Alemite Sales.

O. M. Wells, automobile dealer in a town of only 1,735 population writes as follows:

"We find that your Sales Cabinet combined with an occasional window trim has materially increased our accessory business. At least 75% of all cars that come in for lubrication can be equipped with the Alemite System with *scarcely any sales effort*."

The most important part of this statement is not the high percentage of sales—but the fact that *lubricating service* helps these sales. And vice versa, the sales increase the profitable lubricating service business.

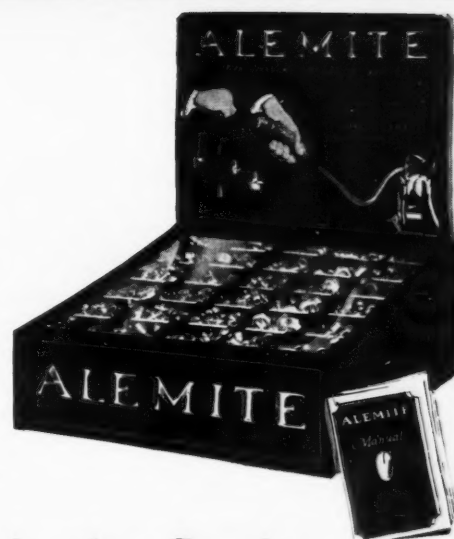
It is this combination, car dealers say, that make Alemite Sales and Service the best paying side line they can get. And Alemite profits are *cash* profits.

A L E M I

How to Start

Alemite Sales and Service

When you start selling Alemite you might do very well without any assistance from us. But we have a complete and tested dealer sales plan that we know brings results. It will add to your profits. At the right is the Alemite Sales Cabinet. This is the cornerstone of the plan. It holds your investment to a minimum. Yet you can always supply a complete installation for any make or model of car. The Alemite Manual tells at a glance what fittings to use and where they go.



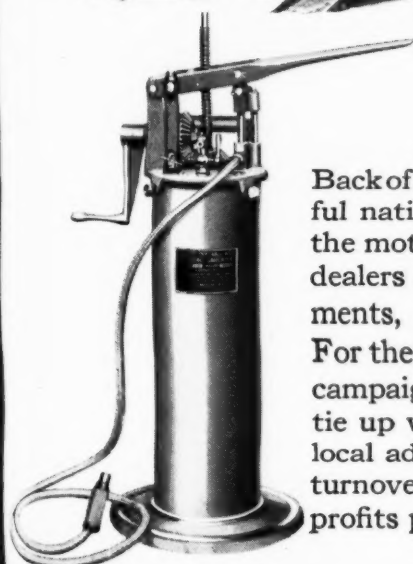
Lubricating Service

Lubricating service will increase your sales of Alemite. It will also help your car sales for it will keep you constantly in touch with a large number of prospective buyers. Aside from this it means a year round revenue of \$40 to \$200 or more per week. We give you definite details on how to start an up-to-date lubricating service station on an investment of as little as \$200. Ask for our booklet entitled "How to Go Into the Lubricating Service Business."



Advertising

Back of all the Alemite products is a powerful national advertising campaign urging the motoring public to go to the Alemite dealers for lubricating service, replacements, and installation of new systems. For the dealers we have well-planned local campaigns, signs, etc., that enable you to tie up with this national publicity. This local advertising assures you of the fast turnover that gives you 5 to 10 or more profits per year on your investment.



For fast and efficient lubricating service use the H-15 compressor.

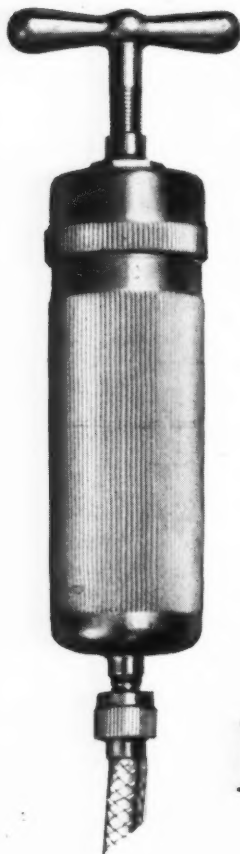


ITE

*High pressure
lubricating system*

Expand Your Business Without Tying Up Capital

Today probably every car dealer realizes the need for expanding his business. With Alemite Sales and Service you can do this on a small investment—with assurance of success. And in most cases *your investment will be returned out of profits in much less than a year.*



For the Alemite line gives you three extra returns. First, you get profits on the sale of Alemite systems, and replacements for fittings lost, stolen or broken. Also sales of Alemite Lubricating Spring Covers, Alemite Gas-Collectors, Alemite Lubricant in cans and Alemite Penetrating Oil. Next, you get profits of \$100 to \$200 or more per month on lubricating service. And finally, you make regular year round customers out of car buyers, thereby increasing your car sales—and profits.

By simply installing the Alemite Sales Cabinet you can increase

your business from \$500 to \$2,000 per year conservatively. With the complete Alemite line and Lubricating Service you can triple or quadruple these figures easily. We can show you how to do it.

So far this year our dealers' sales have tripled over any similar period last year. Over 4,000,000 cars are now Alemite equipped. The demand for fittings for these cars to replace the ones broken or lost is enormous in itself. The need for Alemite Lubricating Service is even greater. Send the coupon today. We'll tell you how easy it is for you to get your share of the cash profits in Alemite.

Put Up This Sign—

ALEMITE
*High pressure
lubricating system*

BASSICK MFG. CO.
2662 N. Crawford Ave.
Chicago, Ill.

Send us details of your business building plan for car dealers, and your booklet entitled "How to Go Into the Lubricating Service Business."

Name

Address

City and State

"How to Go Into the Lubricating Service Business" is a book that is full of profit-making plans used in this new branch of automobile service—Get it today.

America's Leading Tire Pump

Eight years of leadership finds the Rose Tire Pump today more firmly entrenched in the good will of jobber, dealer and public than ever before.

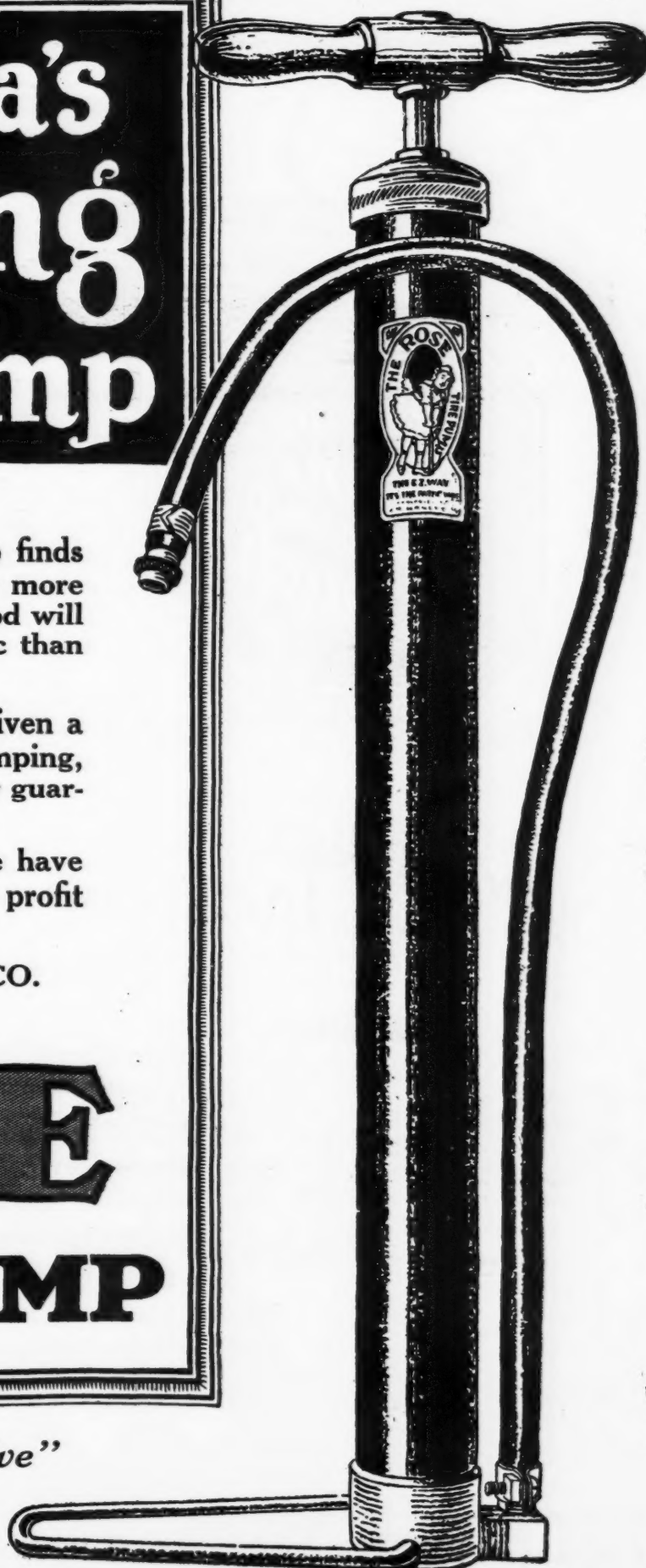
To the public we have given a splendid value—Easy Pumping, moderate price and a 5-year guarantee.

To jobber and dealer we have given an active, dependable profit item.

FRANK ROSE MFG. CO.
HASTINGS, NEBR.

ROSE TIRE PUMP

"It's All in the Valve"





THE time saved—the jobs done better and quicker through the development of the electric portable drill—cannot be measured in dollars, but the sum is a huge one.

Jacobs Chucks—keeping pace with the development of drilling methods—have so firmly established themselves in their particular class that they have been selected as standard equipment by the manufacturers of the best drills made and used in the industry.

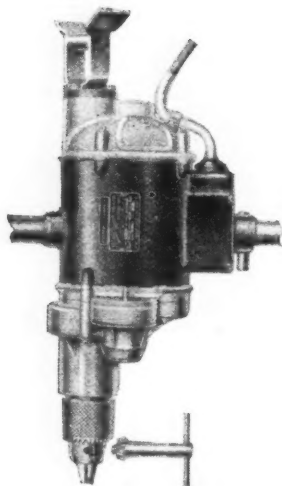
Jacobs quality is responsible for this. Jacobs Quality is also YOUR guarantee.

THE JACOBS MFG COMPANY, HARTFORD, CONN.

This advertisement inserted in the interest of better Service Equipment in general and the use of Portable Electric Drills in particular



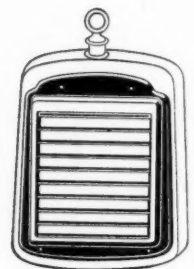
"Hisey" super



The Hisey-Wolf Mach. Co.
Cincinnati, Ohio

Installing Radiator Shutters

This job can easily be a costly one. A hand drill will string out the work and take all the money out of it. But drilling the necessary holes with a portable electric drill will net a respectable profit through time saved and efficient handling of the whole job.



(CATALOGED)
in the Red Directory

"Speed Up Service With Machine Tools"



Leadership Never Just "Happens"

It is the result of public confidence resulting from well founded manufacturing and merchandising standards, conscientiously followed.

Leadership does not occur over night. It requires years of careful building from a firm foundation. Sincere efforts in manufacturing, proper merchandising methods, prompt service, national advertising, full value given for value received—these lead to the front ranks.

Gill Standards of Quality, Accuracy and Service, plus years of honest endeavor and public confidence have placed us in the front ranks of the leaders.

GILL Interlocking Joint Piston Ring is the leader in the patented ring field. The specially constructed joint prevents any leakage at this point.

SPECIAL Oil-Wiper Ring perfectly controls the distribution of oil over the cylinder walls.

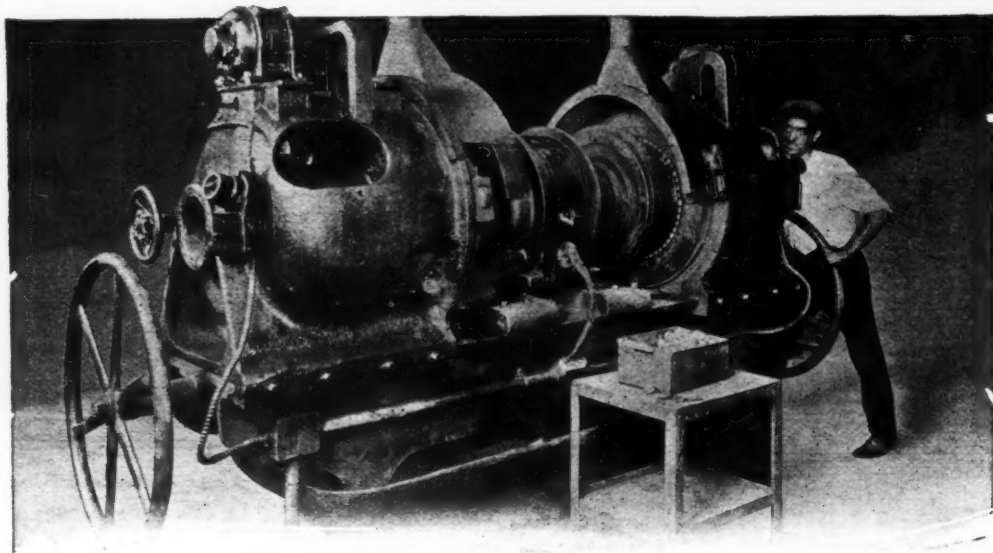
SERVUS plain step-cut ring satisfies the demand for a ring of this type.

GILL Piston Pins are the exact duplicate of manufacturers' design and steel specifications. Tolerances are held to a minimum to produce accuracy.

GILL MANUFACTURING COMPANY — 8300 South Chicago Ave., CHICAGO

Gill

Piston Rings *and* Pins



Even the Rough Grinding of Atlas Balls Involves Great Skill and Accuracy

AFTER being hardened evenly and uniformly to the center and after sample balls have been subjected to a crushing test, rough Atlas Steel Balls are again put through a rough grinding process. This process is similar to the first rough grinding of the ball blanks except that a finer wheel and a slightly lower speed are used.

As the balls have been hardened and as a finer wheel is used, they are more nearly round after this second rough grinding process. In fact, they are reduced in this operation to approximately .007 inch above size and within a tolerance of .001 inch in sphericity.

Great care has to be exercised in the process of rough grinding to prevent the formation of soft spots which would cause the rejection of the balls in the subsequent operations of precision grinding, polishing, inspecting, etc.

It is through the use of the most highly developed machinery and workmen trained to produce just one grade of ball, that Atlas has won the distinction of being synonymous with balls that are of exceedingly great accuracy, of high finish and of great endurance under load. Users who measure ball values on the basis of service, find that Atlas Steel Balls meet their most exacting requirements.



ATLAS BALL COMPANY

Glenwood Ave. at Fourth St. Philadelphia

999

ATLAS

ALSO BRASS, BRONZE,



STEEL BALLS

MONEL AND SPECIAL METALS

Made Under
SKF
Supervision

AUBURN

New 1924 Models

New Low Prices

A Wonderful Dealer Opportunity

The new 1924 Auburn Line is attracting new buyers—just as it won Auburn distributors who viewed it several weeks ago. Reports from various parts of the country point to record-making increases in sales. Auburn is truly going strong!

There is something contagious about enthusiasm. And especially when founded upon an honest product, honestly made, rightly priced and generally appreciated.

New sales opportunities and larger profits are being opened up by the new 1924 line of Auburns. New values in automobiles are established. The Auburn Franchise is exceptional!

To those dealers who are looking ahead, Auburn offers outstanding advantages. Each Franchise is fully protected, written for dealers as well as the factory, and carries intensive factory co-operation far out of the ordinary.

*Look over the prices below and write us
for complete information.*

Auburn Automobile Company
Auburn, Ind.

	OLD PRICE	NEW PRICE
6-43 Touring	\$1165	\$1095
6-43 Sport	New	\$1325
6-43 Touring Coupe	\$1535	\$1495
6-43 Sedan	New	\$1595

	OLD PRICE	NEW PRICE
6-63 Touring	\$1725	\$1595
6-63 Sport	\$1985	\$1850
6-63 Sedan	New	\$2345

All prices f. o. b. Auburn



Note the position of the MANLEY Wrecking Crane on the service car. Not away back toward the rear edge of the platform, not even as far back as the rear axle, but WELL FORWARD of the axle. This is one secret of the wonderful lifting power of the MANLEY.



Without Question the Greatest Wreck-Handling Equipment So far brought out

Don't improvise—get a crane



Nothing is a better advertisement for your business than to be known as the man who can bring in ANY car no matter how badly wrecked. What the MANLEY can't tow in, it picks up bodily and carries.

Be sure you pick out a wrecking-crane that can "get" anything you go after—IN THE SHORTEST POSSIBLE TIME AND WITH THE FEWEST NUMBER OF MEN.

With this in mind you will not be satisfied with any crane but a MANLEY. There are no BENT structural steel members in the Manley Crane. Everything is STRAIGHT for greater strength. The top extension is DETACHABLE by removing two nuts.

The Crane mounts on any chassis without the expense of special forgings, etc. Just bolts on. Comes off in three minutes when it can be used for other purposes. Two cranes in one.

The Crane Beam tilts at any angle—another reason for MANLEY ability to pull any wreck out of a hole. FOUR different leverages.

Three sizes—two 2-ton and a 5-ton for trucks. Special Crane bulletin mailed to any address.

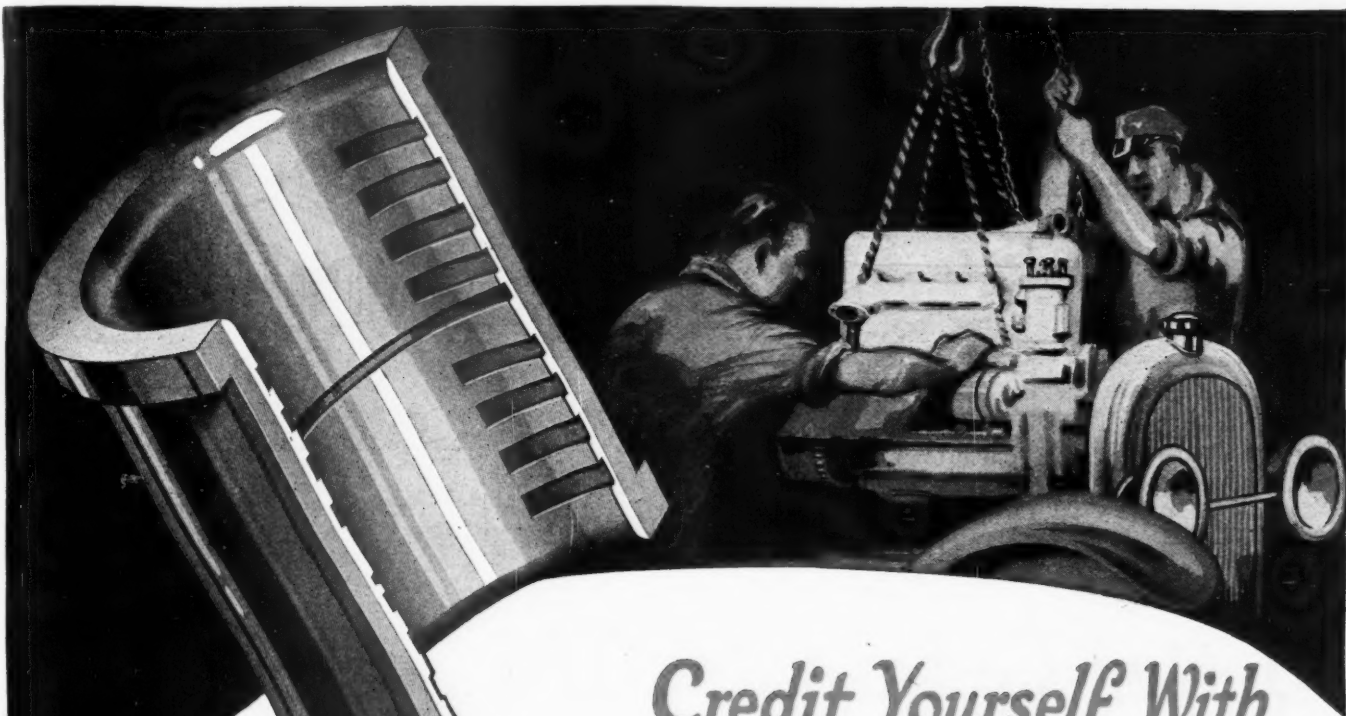
MANLEY MANUFACTURING CO., YORK, PA.



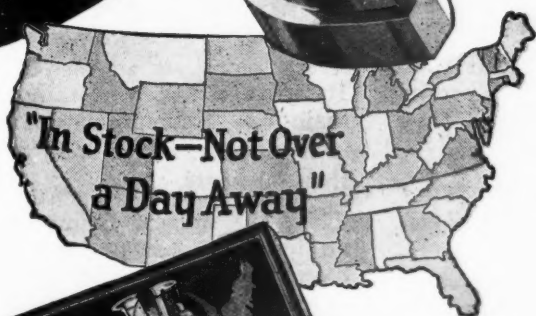
Manley

Garage Equipment

MADE IN YORK PA.



Credit Yourself With Another Solid Customer



Get this Handy Bearing Guide

Save time with this handy booklet listing cars, trucks and tractors with bearing stock numbers of each. Sent gladly, with the name of our nearest distributor. No obligation.

"WALT, if Smith doesn't faint dead away when we tell him his 'groaner' is ready a whole day before he expects it, I'll miss my guess!"

"Sure beats the dickens how those 'Milwaukee' distributors snap into it when we wire for Milwaukee Bearings. Never saw such pep in my life! Do you realize that twelve hours after this old chariot clattered in we were unwrapping a new set of bearings?"

"I sure do, Jerry, and take it from me, those are bearings — as fine as I ever scraped in!"

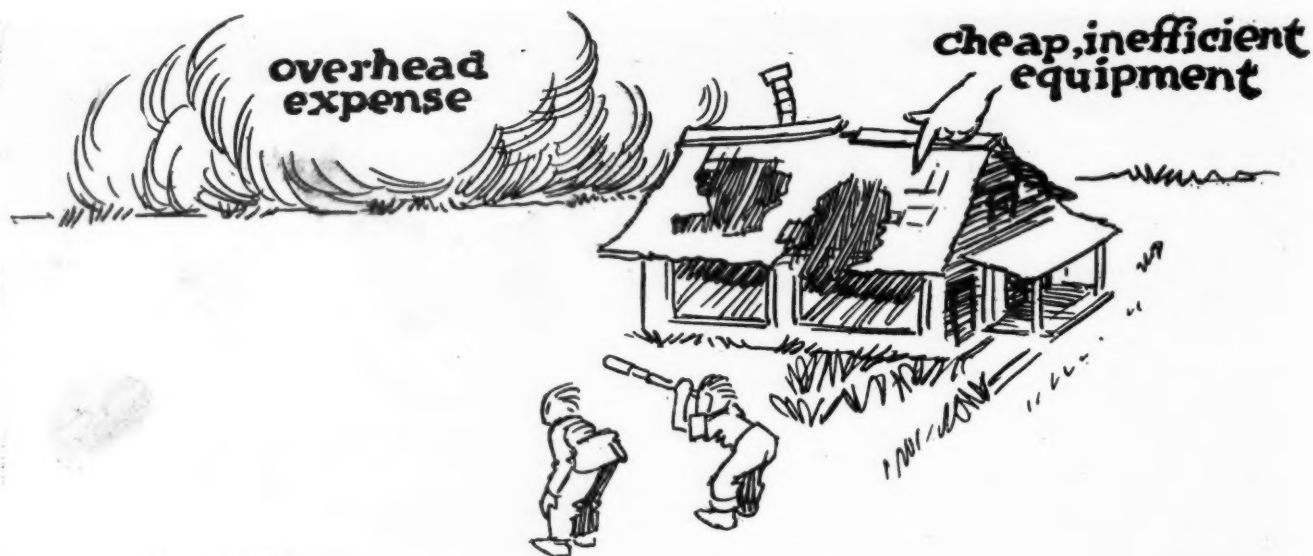
* * * *

Nothing will tie a customer closer to you than a bit of unusual, snappy, unexpected service on a bearing job.

You can make it a regular feature of your shop with "Milwaukees". Service on these great bearings is never more than a day away — no matter where you are. There's real profit in them, too—more than you think.

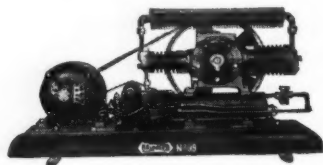
MILWAUKEE DIE CASTING COMPANY
MILWAUKEE WISCONSIN

MILWAUKEE BEARINGS



Better Get a GOOD Roof or You'll Be ALL WET!

TO specify just one instance—the Brunner Model 939 is the fastest working $\frac{3}{4}$ hp. unit built. Pressure in the 32-gallon tank rises from zero to 175 lbs. in less than 25 minutes. A pressure rise of 25 lbs. is a matter of 5 minutes or less. The answer is not excessive speed; it is the astonishing efficiency produced by dual valves, larger intercooler and snugly fitted polished pistons. No other machine approaches this air delivery with a similar motor.



OUTSTANDING FEATURES:

1. QUICK STARTING
2. SILENT OPERATION
3. FASTER WORK
4. LOWER COST
5. A LONGER LIFE
6. ABSOLUTE SAFETY

(CATALOGED)
in the Red Directory



"Good for 20 years
at Hard Labor!"

PROFITS are what you want. Are your profits NET Profits? Or are they drowned by your Overhead?

Overhead isn't the Price of Equipment—it's the Upkeep Cost.

Cheap Equipment may seem economical when you first buy it, but it's really the most expensive thing you can buy. It rolls up Overhead, it eats up Profits, it increases Depreciation. And it gets steadily worse in this respect every day it's in use.

The PRICE of a Brunner Compressor is higher than others of inferior design and manufacture. It has to be higher, for a Brunner is made of better material, and by methods of manufacture which necessitate the use of special jigs and fixtures, the grinding of contact surfaces, exact alignments and perfect fitting of parts to a thousandth of an inch.

But that price is only a little bit higher, and the actual cost of a Brunner is very much less than any other compressor equipment you could buy.

A Brunner wastes no time. It starts instantaneously. It runs smoothly and silently. It de-

livers more air in less time. It costs next to nothing to maintain. Its depreciation cost is negligible, for it lasts more than 20 years.

The 1923 line of Brunners is an improvement on any that have gone before. The 2-stage Brunner has 20 features possessed by no other machine. The power, speed and efficiency of the 2-cylinder, divided-load Brunner is unapproached.

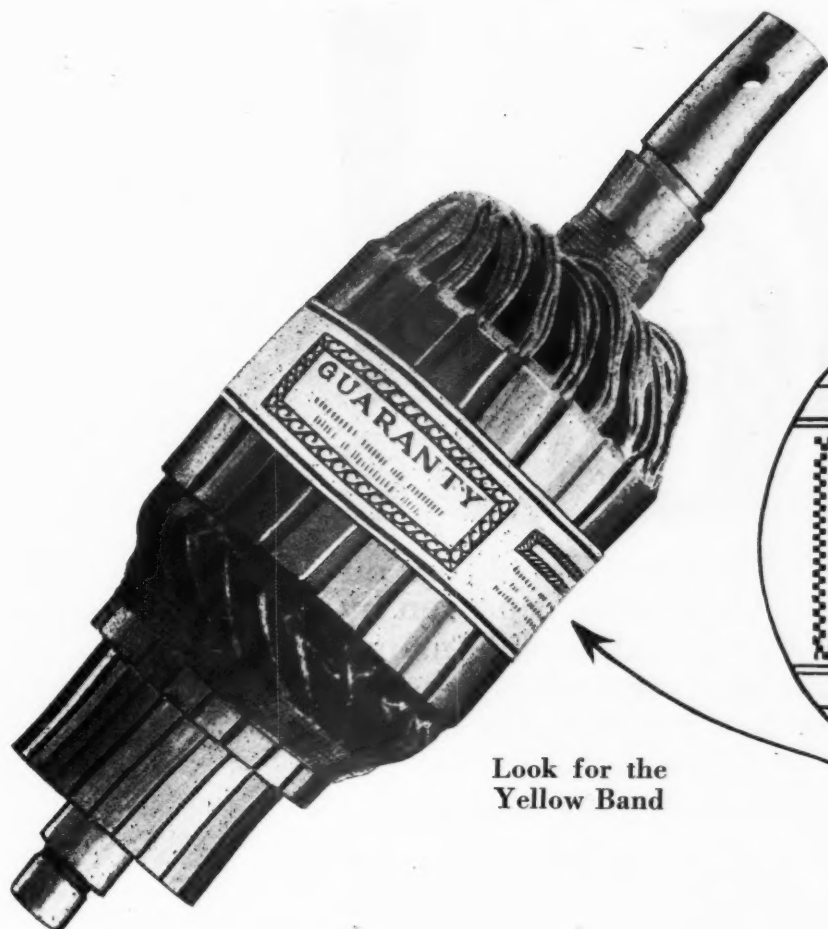
To buy a Brunner is to reduce your overhead, to save your workmen's time, to multiply the number of air service jobs you can do in a day, to eliminate air trouble, noise and vibration, to give your customers quick service and save yourself trouble and expense.

The Brunner Compressor was born with the Automotive Industry, to fill a pressing need. It has kept steady pace with that need. Today there is a Brunner of a size, capacity, and equipment, exactly to fit the requirements of any automotive dealer. Write us and get the benefit of our 20 years' experience. It will increase your profits and decrease your trouble and expense.

BRUNNER MFG. CO., Utica, N. Y.

Oldest and Largest Manufacturers of Garage
Air Compressors in the World

UTICA, CINCINNATI, KANSAS CITY
SAN FRANCISCO



Look for the
Yellow Band



Note the Terms of Our Guaranty

PRICES

Ford Armature
Rewound, \$2.00
Any Two Unit
Generator
Armature Rewound
\$5.00



Write for this Booklet

It contains complete price lists for all classes of work and much valuable information about armature rewinding. Send for a free copy.

We state expressly that we guarantee every armature we rewind to give the same service as a new one. If the quality of our work was not the very highest we could not afford to issue such a broad guaranty. Experts who have been thoroughly trained in their work are employed in our shops. Every armature is wound from a blue print according to original factory specifications. Exactly the same size wire is used as was used originally. When the job is completed we do not hesitate to place back of it the reputation we have been building for years.

We maintain a stock of over 6,000 rewound armatures for exchange purposes. We fill your order from this stock the same day we receive the defective units from you, or if you prefer we will rewind the exact cores you send us and reship them in 36 hours.

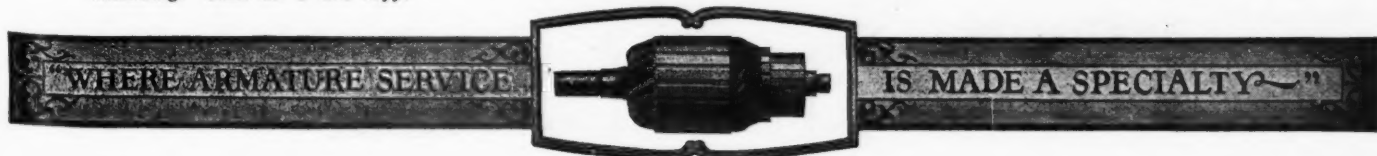
Send in your defective armatures and get the benefit of our quality work, our liberal guaranty and our quick service. Note our reasonable prices at the left—they are as low as we can make them and still uphold the quality of our work.

U. S. AUTO SUPPLY COMPANY

Armature Service Division

3845 S. Wabash Ave.

Chicago, Ill.



Yes!

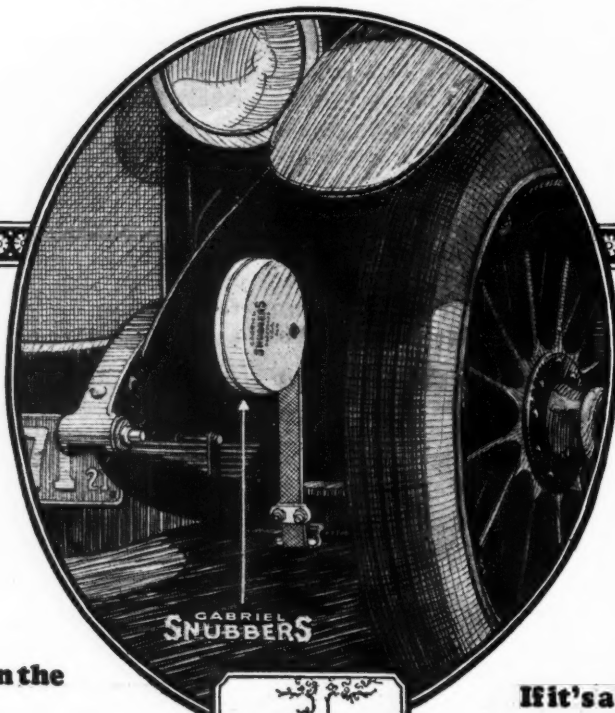
—Gabriel Snubbers should be on your car. Their value is proven by the fact that 71 automobile manufacturers either use them as standard equipment or put holes in the car frames for them.

Sold by legitimate dealers

GABRIEL MANUFACTURING COMPANY
1415 East 40th Street Cleveland, Ohio

GABRIEL SNUBBERS

THERE IS NO OTHER



**Keep You on the
Seat
Save Your Car**



**If it's a Snubber
—it's a
"GABRIEL"**



A Message to Automobile Merchants from Rolls-Royce

OVER three years ago we began building Rolls-Royce in Springfield, Massachusetts. To-day, Rolls-Royce is firmly established, not only in the minds of its contemporaries, but even more so in the consciousness of the high-grade motor-car buying public, and is accepted as an unqualified success.

In every average city and town there are persons who have an appreciation for the fine things of life—and this extends to their motor cars—

whose desire for something better and finer makes them naturally potential owners of Rolls-Royce.

Our sales organization has grown most satisfactorily during the past year. We still have desirable and profitable territory open, where an automobile merchant of financial responsibility, and possessing a high-grade sales instinct, should find a profitable field for Rolls-Royce.

Are YOU, reading this message, the man we refer to?

Twelve exclusive Rolls-Royce designs in open and closed coach work

The four-five passenger phaeton, \$10,900

*For information and particulars, write to
S. deB. Keim, General Sales Manager
SPRINGFIELD, MASSACHUSETTS*

ROLLS-ROYCE

No Rolls-Royce has ever worn out

Now!



BUNTING BUSHINGS *In Convenient Cartons*

Bunting Piston Pin and Spring Bolt Bushings for replacement in all popular automotive vehicles are now packaged in strong cartons of corrugated fibre board, attractively printed and plainly marked with the stock numbers.

There are 24 of the smaller bushings in each carton, and 8 and 12 of the larger sizes. Ask your jobber for this fine new Bunting Package. Write for stock list 18 showing Piston Pin Bushings and Stock list 111, showing Spring Bolt Bushings.

THE BUNTING BRASS & BRONZE COMPANY
Toledo, Ohio



New York
245 West 54th St.,
Circle 0844

Cleveland
710 St. Clair Ave. N. E.,
Main 5991

Branches and Warehouses at

Chicago
722 S. Michigan Ave.,
Wabash 9153

San Francisco
198 Second Street,
Douglas 6245

Boston
36 Oliver Street,
Main 8488



BUNTING BUSHING BEARINGS

PATENTED



Why Joe Didn't Think Much of Our Guarantee

ONE of our salesmen tells this story on himself, so it must be true. He was new on the job then and he undertook to talk Testbestos to Joe S—, who runs a garage in a little town in West Virginia. He didn't know Joe was the champion long-distance kidder of Tyler County.

"Don't tell me about that Testbestos guarantee. It's no good to me," says Joe.

"What do you mean no good?" asks the salesman.

"Suppose," says Joe, "I have a lot o' tires and nobody ever calls for 'em. They ain't much good to me, are they?"

"Well," says Joe, "I reckon I've put about a million feet of Testbestos on cars around here, and I haven't had a call to make good on that guarantee yet."

The Testbestos Guarantee is not intended for our old friends like Joe S—. They *know* Testbestos. They buy Testbestos because they know it makes a good job and a satisfied customer.

We make the Guarantee so that if you have never tried Testbestos you can try it at *our* risk—not yours.

Just between ourselves—we guarantee our product because we know we won't have to come across once in a coon's age. If we had to "make good" very often we could never afford to use the highest quality of long-fibred asbestos, the best of fine brass wire, and treat every foot of Testbestos by an expensive special process to raise its resistance to friction, heat, gas and oil. We could never make Testbestos as good as it is and still meet the competition of more cheaply made linings.

If you don't know who is the nearest Testbestos jobber, write us.

AMERICAN ASBESTOS CO., Norristown, Pa.

THE TESTBESTOS GUARANTEE

If any piece of Testbestos Brake Lining fails to give absolutely satisfactory service, return it to us and we will send you a new piece without charge.

**BRAKE INSPECTION—
—YOUR PROTECTION**

REG. U.S. PAT. OFF.
TESTBESTOS
AUTOMOBILE
BRAKE LINING



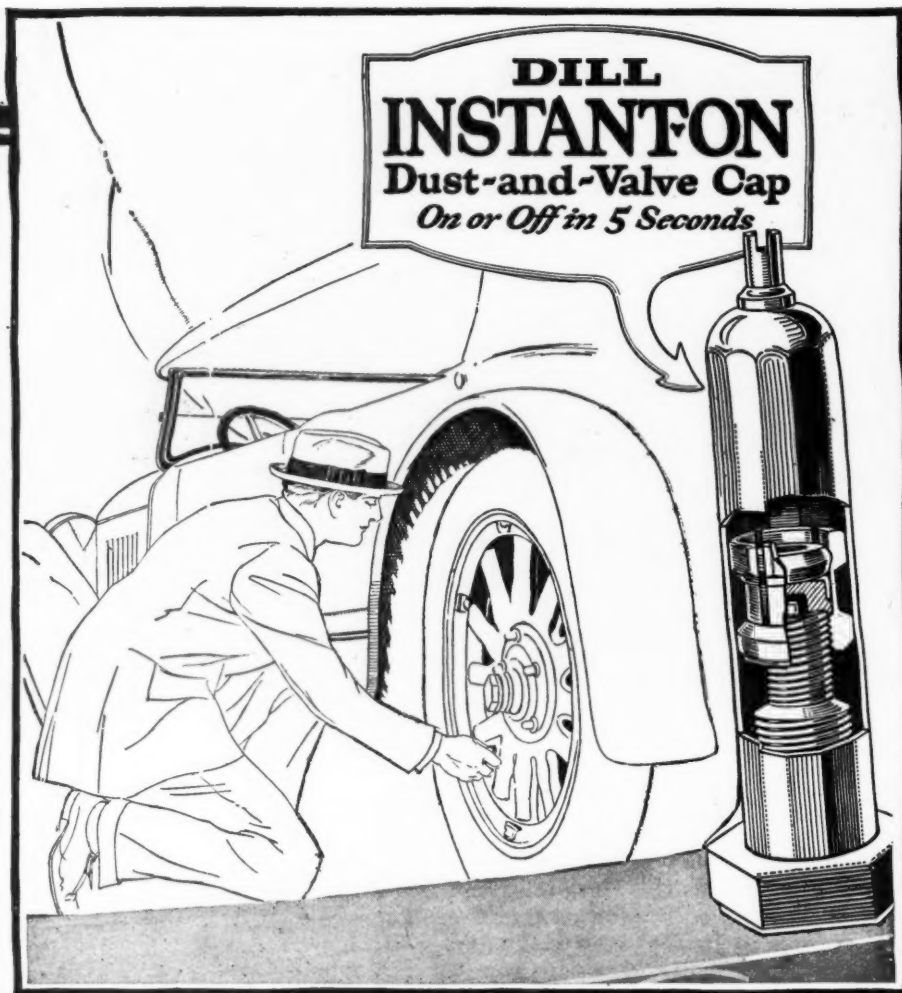
AMERICAN ASBESTOS CO.
Norristown, Pa.

Please send me the name of the nearest TESTBESTOS jobber.

Name

Address

Many of the leading car manufacturers specify these caps as standard on their tire equipment. Look for Instant-ons on the valve stems of the car you buy.



Saving Motorists a Half Million Hours a Year

THE Instant-on goes on or off in less than five seconds. Just a turn or two—then push—another turn or two and it's on. Think how much easier that is than the old-fashioned cap. In the Instant-on, both dust cap and valve cap are combined in one easy-on unit. The valve cap slides up or down within the barrel of the dust cap and automatically adjusts itself to any length of valve stem.

With Instant-ons it's never necessary to use plier or wrench—they save time whenever tires are changed or inflated.

Dealers are finding a ready market for this new style dust cap. Instant-ons are carried in stock by most jobbers. Write us direct if your jobber cannot supply you.

Retails at one dollar for a box of five.

THE DILL MANUFACTURING CO., Cleveland, O.
Manufactured in Canada by The Dill Manufacturing Co., of Canada Ltd., Toronto
Also Manufacturers of Dill Standard Tire Valves and Dill Valve Insides

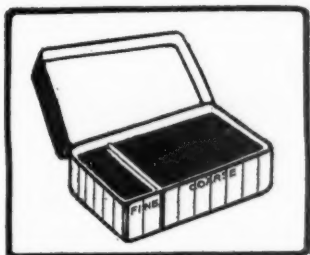
DILL

Tire Valves and Valve Parts



You Can Get a Monopoly on the Valve Grinding Business with Monarch

Used by the automobile
trade since 1907



The New Handy Box Monarch Compound comes in a handy tin, with a division separating the coarse from the fine. In most valve grinding cases it is only necessary to use the coarse, for that reason there is more of this grade in every box than the fine. You only need the fine to put on a gloss finish. Put up to prevent waste. This is the 4 oz. size. List price 50c.

Put Up in Following
Sizes: List Prices.
4 oz. size.....50c
(two grades)
1 lb. size.....\$1.50
(one grade only) put
up in Friction Top
Round Can.

YOU can build up a reputation in your territory that will bring you all the work you can take care of by turning out the best ground valves.

You can do this more quickly with Monarch Valve Grinding Compound, for this compound not only speeds up the work but turns out a finished job that surprises the most experienced motorist.

The service stations that show a profit are paying more attention to the materials used in work of this kind and Monarch is helping hundreds of them to get a majority of the valve grinding business.

Monarch is made by a pioneer in the automotive industry who was one of the first men to make a valve grinding compound, before any was put on the market under a trade name. Genuine Carborundum used as base for abrasive.

For years several of the largest car manufacturers in America have been using Monarch in

the factory and recommend it to their dealers.

Monarch Compound comes in handy 4 oz. flat cans, containing coarse and fine compound. Enough in each can for the average job.

For that next valve grinding job get a supply of Monarch Compound and note the difference it makes and the short space of time it takes to do the job. If your jobber can't supply you write direct.

Producers Outlet Corporation,
Broad Street National Bank
Bldg., Red Bank, New Jersey.



New York Office, 90 West Broadway,
Mr. E. A. Judge
San Francisco Office, Sheldon Bldg., (Market at
First St.) The Maydwell Co.
Seattle Office, 95 Connecticut St., The Maydwell
Co.



Put 'em in by the set

Don't waste your time and your customer's money refacing worn out valves.

Toledo Standardized Valves are made for all cars. They restore original compression to the motor and give long and satisfactory service. The carbon steel stem is electrically welded entirely through the semi-steel head.

Double annealed. Packed in neat boxes. Leading jobbers have stocks.



THE TOLEDO STEEL PRODUCTS COMPANY
TOLEDO, OHIO



TOLEDO *Standardized* VALVES

Valves Exclusively for Over 9 Years

Spring Substitution or Spring Replacement Which?

A mongrel spring or a spring built to the car maker's specifications.

Which will serve the car owner best—which should the dealer prefer to see installed—which will profit the repair man most?

The question hardly needs an answer—but you'll find it completely and convincingly answered on the following page.

To Serve the Car Owner
is to Serve the Industry

Detroit Steel Products Co

You Can Get Detroit Springs for Every Popular Make of Car or Truck All "Built to the Car Makers' Specifications"



Send for this price book today.

You know that nothing less than springs "built to the car makers' specifications", springs that exactly duplicate the original spring equipment, can properly conserve the engine, chassis, body and tires—and *give your customers complete satisfaction.*

You know how original equipment springs are built, how the correct steel composition is definitely determined, how the length, width and thickness of every leaf must meet the most exacting specifications and how they are tested to the thousandth of an inch. You know, too, that small shops cannot comply with these demands.

Then how can you be sure that you are using genuine springs on the limping cars and trucks that come to you for repairs?

Here is One Way to be Absolutely Sure

Insist upon having Detroit Springs. Every Detroit Spring sold for replacement on all makes and models of cars and trucks is "Built to the Car Makers' Specifications."

Each year millions of Detroit Springs are built for original equipment on leading cars and trucks—and millions more are built for replacement. In your immediate territory you will find a Detroit Spring Distributor who can make quick shipment of practically any kind of spring you may need. The short delivery time required will surprise you.

The Detroit Spring Distributor really acts as your depot for springs—saving you freight, cartage costs, warehousing and other overhead and handling charges.

When you can get genuine replacement springs so easily and so quickly, why run risks with mongrel springs? Write today for price list and names of the nearest distributors.

DETROIT STEEL PRODUCTS COMPANY

2815 East Grand Boulevard

DETROIT

MICHIGAN

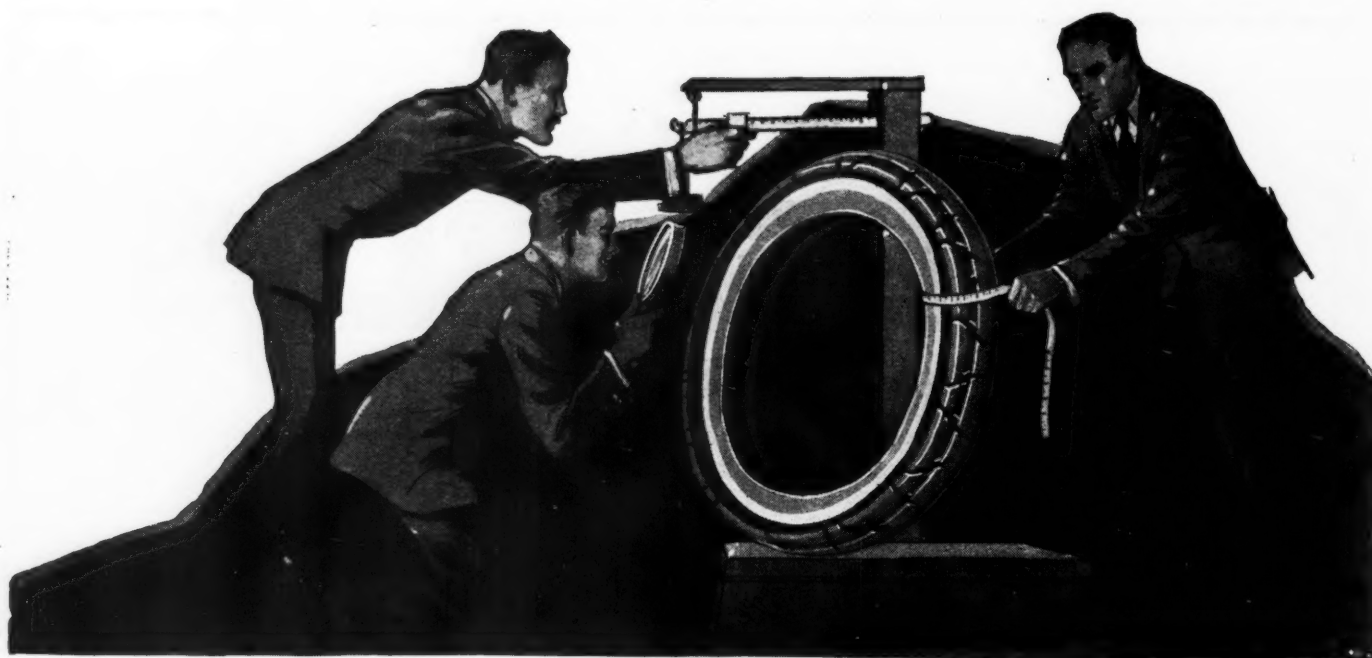


GATES BELTS

"The Standardized Fan Belt"

The man who sells fan belts can't afford to have his orders held up, **especially at this season.** 463 complete jobber stocks of Gates Vulco Belts in leading cities means quick deliveries—**sure profit.**

Made by the World's Largest
Manufacturers of Fan Belts.



Check Up on the Tire You Sell

We invite you to compare the EMPIRE TIRE with the best of today—yesterday—three years ago. During the era of price competition we were careful to leave size, weight and durability untouched, cutting only needless expenses and burdensome overhead in order to allow the dealer to make a generous profit but still uphold his—and our—reputation.

One of the reasons for the never-failing high quality of EMPIRE TIRES and Tubes is briefly explained in

EMPIRE QUALITY QUALIFICATION NO. 2

A Tire That Bears Comparison

Many dealers who buy tires by name alone are surprised when they compare Empires minutely with other tires. In the matter of weight, skim between plies and thickness of tread, Empire casings are unsurpassed by any tire on the market, despite the low price at which they are sold to dealers.

You Owe It to Yourself

to meet the present demand for QUALITY with a tire that still allows you a generous profit. Write today for our attractive dealers' proposition. Dept. 208.



Empire Tire & Rubber Corporation

FACTORIES TRENTON, N.J. U.S.A. MAIN OFFICES



New Departure Ball Bearings

A PEEP INTO THE FUTURE

On what will the competition of the future be focused? The mechanical design of motor cars is becoming more or less standardized, very much as bicycles did ten or twelve years ago. Other competitive features must then replace the succession of mechanical innovations.

Will it be body styles and minor refinements bringing additional comfort and luxury?

Perhaps. But we venture to predict that the ever-growing number of the motor-wise will demand something more substantial—that the nub of the situation will be longer life of parts and a consequent prolonged service at less up-keep cost.

Wear can and *will* be delayed almost indefinitely where every shaft and gear revolves or oscillates, by the even greater use of New Departures—with

the *ball* type principle, its electric furnace high carbon, high chrome steels and exquisite precision. The parts it locates and supports have longer life, because in the New Departure—

Wear is practically eliminated, adjustment is not necessary.

High efficiency due to low frictional loss. Frictional loss is independent of speed.

Frictional loss increases only slightly under load.

Starting friction is only one-hundredth of that of the plain bearing.

Does not heat excessively under loads.

Lubrication problem is simple.

Greater load capacity for a given width than any other bearing.

The only type operating efficiently at high speeds.

Resists adequately all shock loads.

Life is not reduced by continuous service.

Compensates for small shaft deflections.

Carries loads at lowest cost per pound, year or mile.

Lubrication not needed to reduce friction, only to prevent rust.

Interesting literature upon request.

THE NEW DEPARTURE MANUFACTURING COMPANY,

Detroit

Bristol, Conn.

Chicago

Distributed by United Motors Service, Inc., Branches and Agents in Every Town of Fair Size in the U. S. A. and Canada.

Kawneer

SOLID COPPER
STORE FRONTS

Resilient grip on glass
gives permanent service

Kawneer Solid Copper Store Front Construction holds plate glass between two spring shaped members. This Kawneer resiliency allows all vibration waves, such as are caused by the jolting of street cars or trucks, or from sudden wind pressure to pass out thru the edges of the plate without fracture.

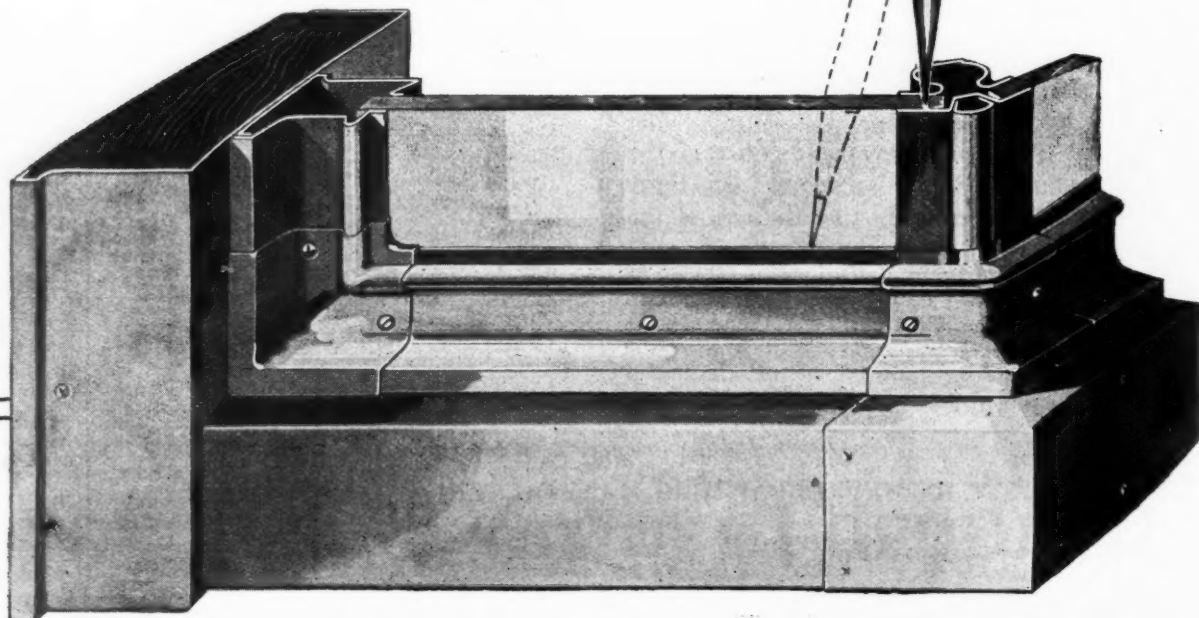
This sturdy but resilient grip on plate glass has proven reliable and efficient in more than 260,000 Kawneer Store Front installations.

If you plan to build or remodel, let us send you a copy of our Book of Designs showing successful Kawneer Store Fronts. Mailed promptly upon request.

THE
Kawneer
COMPANY

2619 Front Street

Niles, Michigan



"mike" it and make sure

Why take chances on fits and measurements when it's so easy to get an **accurate** check with a Starrett Micrometer? *You need a good mike*—here it is: Starrett No. 224, designed specially for you and your work. Ask for it at any good hardware store.

Write for Catalog No. 22 RB and the Supplement describing the new Starrett Tools.

THE L. S. STARRETT CO.

*The World's Greatest Toolmakers
Manufacturers of Hack Saws Unexcelled*
ATHOL, MASS.

STARRETT MICROMETER No. 224

With a range of from 2 to 6 inches at a price much less than you'd pay for the four individual micrometers needed to do the same work. Well balanced, easy to handle, built unusually strong and rugged, and extremely accurate.

Decimal equivalents and lock nut Ratchet stop and 2, 3, 4 and 5 in. Standards, if desired.



Use your Micro- meter for

Fitting

Pistons
Piston Rings
Valve Stems
Etc.

Checking

Crankshafts for out-of-round
Thrust Washers
Ball Bearings for size
Piston Pins for over-size
Pump Shafts
Rear Axle Shafts
Etc.

Measuring

Thickness of shim stock
Wrist Pins
Gears
Bearings
Keys
Screws
Drills
Cam Shafts
Tappets
Small parts of all kinds

for

Reboring and Lathe work, etc.

also

If a customer objects to replacement—put a "Mike" on the old part and show him how badly it's worn. A Starrett Micrometer is Final Authority on an argument of this kind.



Use Starrett Tools

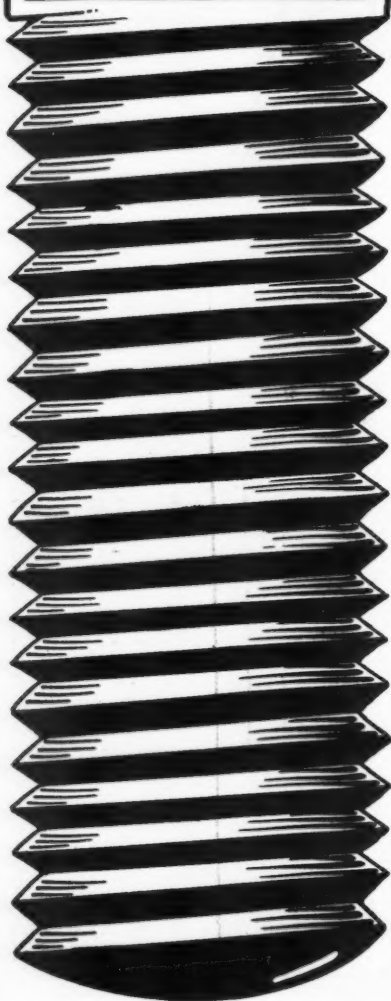
Cap Screws

Absolutely Uniform

Your profits and reputation rest as much on the quality of the parts you use as on the skill with which you use them. Though you be the most careful workman in the automotive business, your work can be improved throughout by using Victor-Peninsular cap screws, nuts and bolts.

One good job doesn't build a reputation. They must all be good. Send for the illustrated book that tells how to make them so.

VICTOR-PENINSULAR CO.
DETROIT, MICH.



Show Ford Owners How to Ventilate their Cars

The Phillips Keep-Kool Ventilator will prove to be one of the fastest selling accessories you can stock for Ford owners this summer. For every Ford owner knows the inconvenience of being closed in with a hot engine and no ventilation.

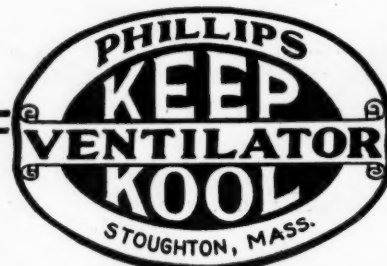
It is only a question of showing this ventilator to make a quick sale. Any Ford owner can attach it in fifteen minutes by simply sliding the ventilator into the windshield frame.

Gives ventilation the full width of the windshield and arranged so that the air is deflected down under the cowl to the floor by projecting vane. Made entirely of steel parts welded together, with black enamel finish. No screws to make tight or loose. Cannot rattle.

Ask your favorite jobber to send you a dozen. In case he cannot supply you immediately, write direct. Manufactured by

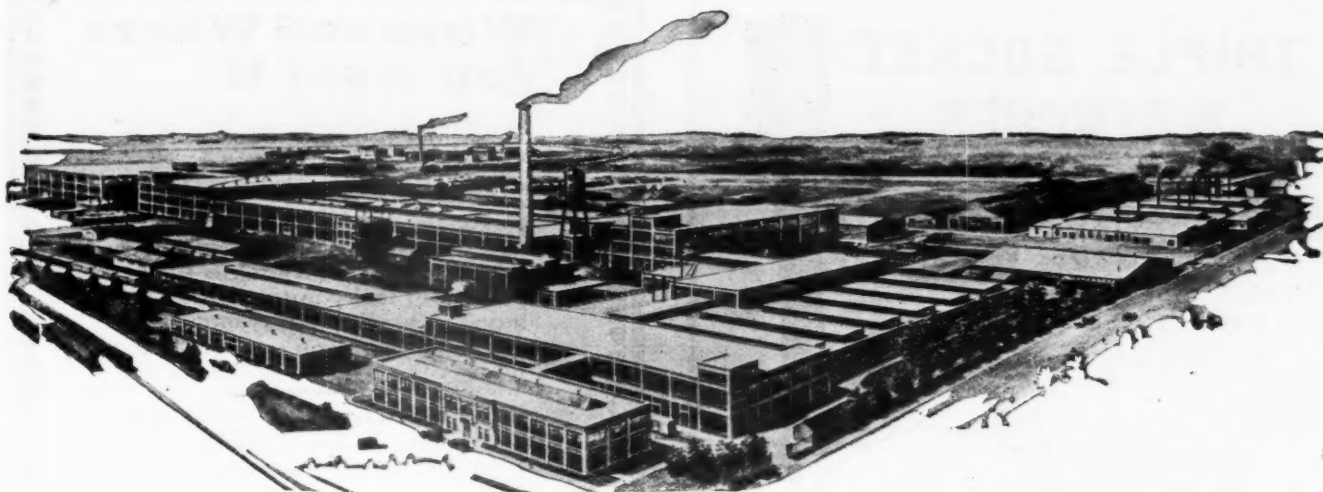
F. C. PHILLIPS CO., STOUGHTON, MASS.

*Manufacturers of all types of
screw machine products.*



List Price
\$5.00





How automotive progress created the Prest-O-Lite Battery

Until the self-starter was developed, "Prest-O-Lite" meant a lighting system—just as it means today the best gas lighting system for trucks. But the refinements in automobiles brought about by the self-starter called for a better storage battery for starting, lighting and ignition.

Drawing on years of manufacturing experience Prest-O-Lite secured the services of storage battery engineers of mature experience and developed Prest-O-Plates—the heart of the battery. Combining the necessary hardness with ample porosity these plates give both quick and powerful action in the coldest weather and unusually long life.

Prest-O-Lite Batteries have met the critical requirements of scores of automobile makers and millions of automobile owners. Enlarged three times, the great Indianapolis plant shown above, with its 16 acres of floor space, meets the ever increasing demand. And the "friendly service" of Prest-O-Lite stations everywhere doubles the satisfaction of Prest-O-Lite owners.

THE PREST-O-LITE COMPANY, Inc.
INDIANAPOLIS, INDIANA

New York Office: 30 East 42nd Street

Pacific Coast Office: 599 Eighth Street, San Francisco

In Canada: Prest-O-Lite Company of Canada, Limited, Toronto

Dealer Note:

If there is no Prest-O-Lite distributor in your city you can buy direct from our factory at factory prices. Write us.

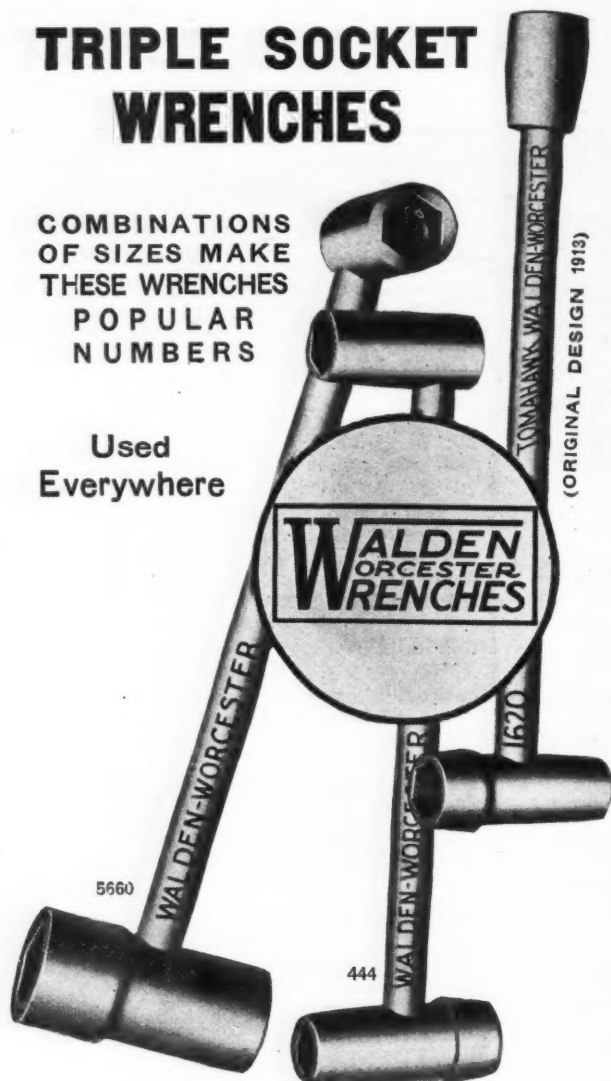


THE OLDEST SERVICE TO MOTORISTS

TRIPLE SOCKET WRENCHES

COMBINATIONS
OF SIZES MAKE
THESE WRENCHES
POPULAR
NUMBERS

Used
Everywhere



THIS trio of Walden-Worcester Wrenches, because of the combinations of sizes making them available for work in innumerable places on cars, are very popular numbers.

WALDEN-WORCESTER
INCORPORATED

WORCESTER

MASS.

"When and Where you want it"

—writes brother Kneisley. Read what he says:

"We are in receipt of your sample of Kester Acid-Core Wire Solder and wish to say we find it much superior to other solder in the repairing of leaky automobile radiators, as you have the solder and the acid where you want it, when you want it."

Exactly what we've said, time and again, and will gladly prove it. Write us for a sample.



Sold by live dealers everywhere in one pound coils, in cartons, and on one, five and ten pound spools

Manufacturers

CHICAGO SOLDER COMPANY

1711 Wrightwood Avenue, Chicago

Direct Factory Representatives:

THE FAUCETTE HUSTON CO.
Chattanooga, Tenn.

LOUIS J. ZIESEL CO.
216 Market St.
San Francisco, Cal.

DAVIES-ELY CO.
66 W. Broadway
New York City

KESTER
Acid Core WIRE SOLDER



Requires Only Heat

Reduce the Skidding Danger!

Buick Four-wheel Brakes



BUICK four-wheel brakes reduce to a minimum the skidding danger every driver encounters on wet pavements.

The action of the simple yet positive Buick brakes not only slows down the car safely but keeps it steady, preventing skidding to either side.

Buick four-wheel brakes operate with slight pressure on the service brake pedal, are of the Buick-proved external contracting type and function independently of the emergency brake.

Buick has taken this advanced step of designing four-wheel brakes on its 1924 cars in conformance with its well-known policy of providing owners with the safest and most dependable transportation.

We will be pleased to give you a demonstration and let you prove the effectiveness of Buick four-wheel brakes yourself.

BUICK MOTOR COMPANY, FLINT, MICH.

Division of General Motors Corporation

Pioneer Builders of Valve-in-Head Motor Cars

Branches in All Principal Cities—Dealers Everywhere

Sixes

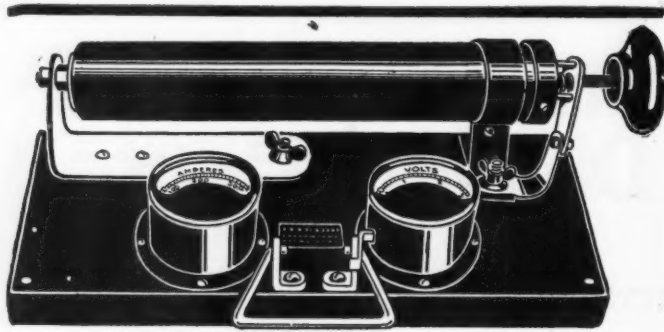
5 Pass. Touring - - - \$1295	7 Pass. Sedan - - - \$2285
2 Pass. Roadster - - - 1275	Brougham Sedan - - - 2235
5 Pass. Sedan - - - 2095	4 Pass. Coupe - - - 1995
5 Pass. Double Service Sedan - - - 1695	Sport Roadster - - - 1675
7 Pass. Touring - - - 1565	Sport Touring - - - 1725

Fours

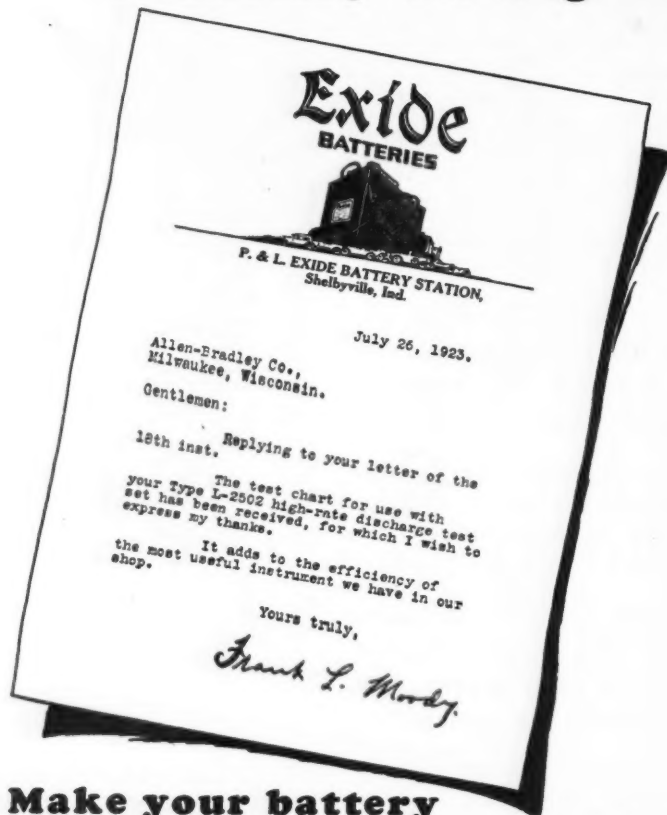
5 Pass. Touring - - - \$965	5 Pass. Sedan - - - \$1495
2 Pass. Roadster - - - 935	4 Pass. Coupe - - - 1395

Prices f. o. b. Buick Factories; government tax to be added. Disc Wheels optional, \$25 net additional charge.

When better automobiles are built, Buick will build them



Another Battery Station Adopts the Chart Method of Battery Testing



**Make your battery
shop efficient and profitable!**

Mail the coupon!

Allen-Bradley
TYPE L-2502
HIGH-RATE DISCHARGE TEST SET

Allen-Bradley Co.
Electric Controlling Apparatus
281 Greenfield Ave.

Milwaukee, Wisconsin

Please send us your latest bulletin on the Chart Method of
Battery Testing and a reproduction, in color, of the test chart.



9 Out of Every 10 of Your Customers Need New Jacks

You know how many cars come equipped with poorly constructed, cheap jacks. You have sold good jacks to the owners of hundreds of such cars. But what about the other hundreds who have these same makes of cars and the poor jacks which came with them. Have you asked 'em to buy?

It's easy to sell them new jacks. Here's the way one wide-awake dealer recommends:

"Jot down the makes of cars which come equipped with poor jacks. (Look in a few of the tool boxes in the cars in your shop, if you aren't sure.) Then when a customer comes in for gas or repairs, you can make a pretty good guess from the make of his car whether he needs a dependable jack."

Show him your stock of Reliables. The No. 9 for light cars—the No. 46 for heavier cars—or the new No. 5-A with its 34-inch detachable folding handle. He is bound to like one of the Reliable line. And it will be an easy job for you to sell him one.

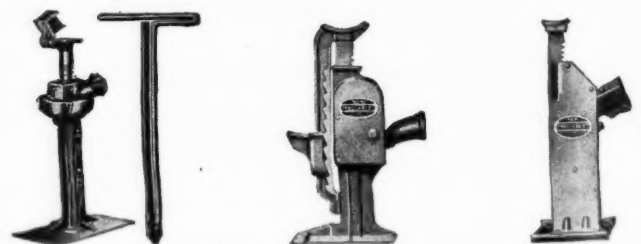
Over 5,000,000 Reliable Jacks have already been sold. Are you getting your share of the profits of the 6th million? Write for our catalog and price list of the complete Reliable line.

ASK 'EM TO BUY

Elite Manufacturing Co

Department M.A. 9

Ashland, Ohio



RELIABLE JACKS



When Servicing Car or Truck Install New Packard Cable

A new Packard Cable installation costs your customer but little. A defective cable costs him more in money, time and peace of mind.



And 90% of those who drive cars and trucks of former models will welcome your suggestion that new lighting, starting and ignition cable be installed.



Recommend new Packard Cable and you assure yourself an endless source of profit.

Ask your jobber's salesman or consult either Automobile Directory.

(CATALOGED)
in the Red Directory

The Packard Electric Company

WARREN, OHIO



Here's An Accelerator That Sells

It offers so much in convenience and comfort that a Ford-owner seldom hesitates to reach for his pocketbook after you have shown him a

D-P ACCELERATOR

It stays sold, too, for it is absolutely fool-proof, being designed on the principles which make big-car accelerators perform so well. You have no complaints or make-goods on a D-P Accelerator.

It is so simple to install (taking less than ten minutes) that you don't cut into your profit, even if you install free.

With easy sales, a big profit, and quick turnover, you can ask for nothing better than a stock of D-P Accelerators to help you make your first million.

Only a hundred selected jobbers can handle D-P Accelerators. Send now for the name of the nearest and start making money. We'll help you.

List Price \$2.50

Davis-Palmer Co.

4750 Sheridan Road
CHICAGO - - ILLINOIS

Selling trucks and buses is easier when you know the owner's viewpoint

Read Motor Transport

It tells you the problems of the Fleet Owner. It tells you how Fleet Owners are making and can make a success of truck or bus operation.

Just as *Motor Age* tells you how to handle your business, so *Motor Transport* tells how to efficiently operate fleets of motor trucks and buses.

Reading *Motor Transport* will make you a better dealer.

Recommend fleet owners to whom you have sold trucks or buses to subscribe for *Motor Transport*. This magazine will make them more efficient operators.

You will both benefit!

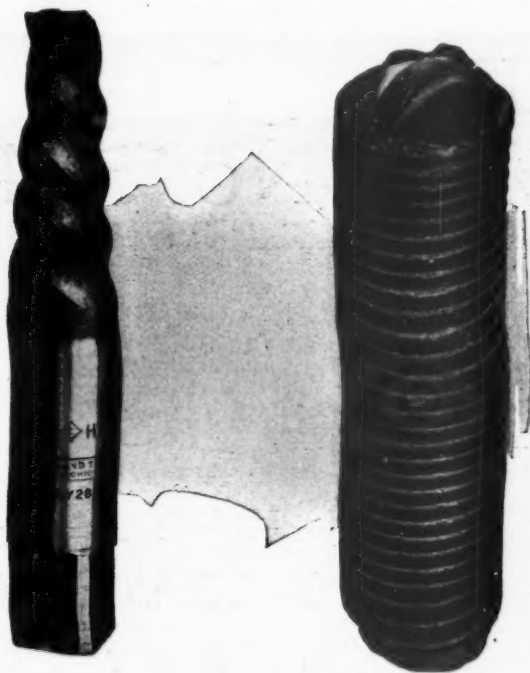
Motor Transport is published semi-monthly, on the 1st and 15th. The subscription price is \$2.00 per year (\$2.50 West of the Mississippi).

Write for a sample copy.

**Motor
Transport**
FORMERLY COMMERCIAL VEHICLE

(Published by the Class Journal Co.)

239 West 39th St. New York, N. Y.



Here's a Big One

There's a story attached to this broken bolt. It came out of the engines of a large lake steamer. The man in charge of the repairs decided he must drill and chip this big bolt out, and, perhaps, retap. In fact, he had begun the job. Along came the engineer and said: "Jim, why don't you use an



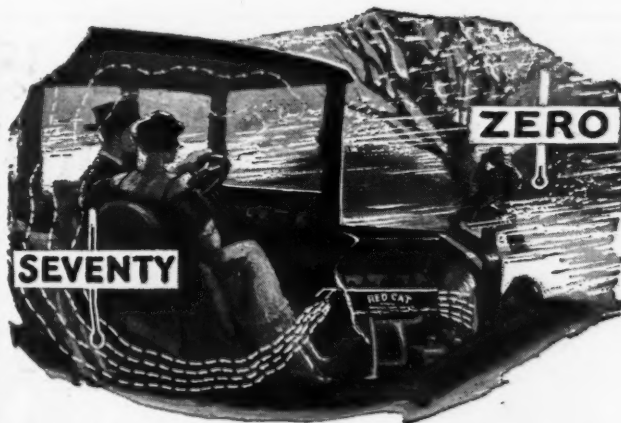
Result. This bolt was out one minute later. It was a tough one. See how the extractor gripped the sides of the broken bolt. But it saved hours of time.

Ezy-Outs will remove any broken bolt from small electrical parts to great cylinder head stay bolts—and save hours of time over a year's period.

You should have a set in your shop.

Ask your dealer or write us for particulars.

The **CLEVELAND** TWIST DRILL COMPANY
CLEVELAND
NEW YORK - CHICAGO - LONDON
TRADE MARK REG. IN U. S. AND FOREIGN COUNTRIES



STOCK Red Cat HEATERS NOW!

In a month cold weather will open the heater season. Are you ready?

Order your stock of new, improved Red Cats at once. Second to none for quick profits and satisfactory service.

Lowest in price. Guaranteed quality. Positive heat flow. Easy heat control. Warms the floor first. Maintains 70 degrees in zero weather.

Your stock of Red Cats will bring you enthusiastic customers and bigger profits.

Ford \$1.50

Chevrolet \$4.00

Dodge \$5.00

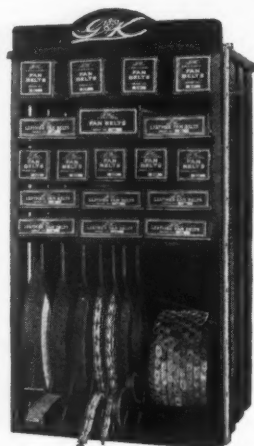
Nine out of ten jobbers carry the Red Cat line. If yours does not—order direct.

G. A. ROTH MFG. CO.
HASTINGS, NEBR.

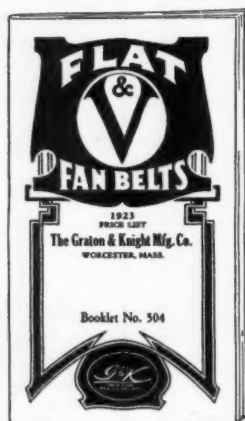
IT IS OUT!

G. & K. BOOKLET No. 504

The Complete Fan Belt Data Book



+



IT WILL HELP YOU SELL
G. & K. LEATHER
FAN BELTS

REAL STEER HIDE BELTS; NATURAL COLOR

The Graton & Knight Mfg. Co., Worcester, Mass.

WRIGHT HIGH-SPEED
HOISTING & CONVEYING OUTFIT

ONE TON OUTFIT
15 Ft. 6" I-Beam

1 Ton Plain Trolley

1 Ton High Speed Hoist
NECESSARY HANGERS \$ 100 00
PRICE COMPLETE

1/2 TON OUTFIT
15 Ft. 6" I BEAM
1/2 TON PLAIN TROLLEY
1/2 TON HIGH SPEED HOIST
NECESSARY HANGERS \$ 80 00
PRICE COMPLETE

WRIGHT
MANUFACTURING
COMPANY
LISBON, OHIO



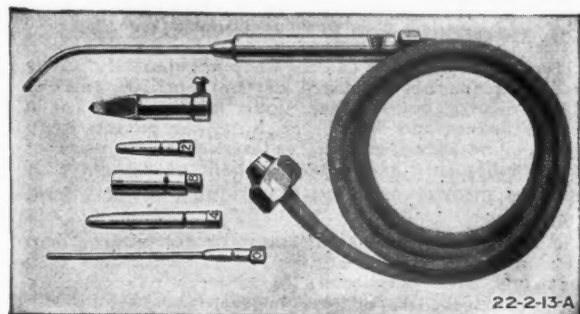
REPAIRING BATTERY

DON'T WASTE TIME

with slow methods. You can solder, or do light brazing in one-half the time with a TORIT TORCH OUTFIT No. 13. Ready the instant you light it. For Radiator repairing, Battery work, loosening rusty and corroded nuts, splicing wires, heating, and hundreds of other uses. Uses Acetylene only.

Outfit complete including torch, 4 different tips, soldering copper, 5 ft. hose and tank connection **\$7.50**

TORIT TORCH OUTFIT NO. 13



Get your Torch today from your jobber, or

ST. PAUL WELDING & MFG. CO.

169 W. THIRD ST.

ST. PAUL, MINN.

—the waterproof steel case battery
that defies the elements!



Concentrate on the Columbia Line and build your trade on the basis of permanence!

Stationary gas engines and tractors, too, work better on ignition current from the Columbia "Hot Shot" Battery.

The higher *sparking power* of Columbia makes it vastly more dependable for all-round ignition; its *endurance*, that capacity to "last longer," makes it far more economical than any other source of current.

With these advantages, the Columbia Line is a sure help in your building up of permanent trade. Concentrate on Columbia and cash in on its superiority.

Your Jobber Will Cooperate 100 Per Cent

NATIONAL CARBON COMPANY, Inc.

Long Island City, N. Y.

Atlanta Chicago Cleveland Kansas City San Francisco

Columbia
Dry Batteries
—they last longer

Story of the TRUSKO Brace



TRUSKO'S 11 Points

1. Makes it possible to utilize more Ford frame area to support weight of motor and transmission.

The TRUSKO Brace for Fords

Patented; other patents pending

LIST PRICE \$2.50

Special model for 1 ton worm drive Ford truck

ends destructive vibration

Tell Your Customers

This:—

The TRUSKO Brace makes it possible to utilize more of the Ford frame area to support the weight of the motor and transmission. Distributed over 20 inches more frame are the jolts and jars otherwise concentrated at the hanger arm points.

To the Ford owner, this advantage alone is sufficient to make the sale. And there are still ten other advantages which will give longer life to his car.

Let us tell you about them;
so you can tell him.

The **TRUSKO** *Inc.*
NAPA, CALIFORNIA

(9)



HENRY One-Lift Auto Jack

Henry, the one-lift auto jack sells easily and quickly because the buyer never again has to "pump" his small car up for tire changing. He just sets Henry, the one-lift auto jack, under the axle, and steps on the lever. In one movement the car rises four inches, and there are five adjustments giving five different heights. The base has 26 square inches which will not let it sink in soft ground. There are no castings to break or gears to crack, all parts are steel.

The Henry one-lift jack cannot drop accidentally. It is locked until another pressure of the foot lets the car gently to the ground. Ask your jobber now for a couple of dozen, and watch the light car owners snap them up. The speed, ease, cleanliness and low price of Henry one-lift auto jacks makes them move fast. Of course that means you get a good, quick profit. Send that order now.

At the same time, ask about our Burns instant drop jack for medium and large cars.

Connections with reliable, responsible distributors are now being made. Write for full details.

Wolverine *Specialty*
Company, Inc.
Battle Creek, Mich.

ALLEN (Bay State) WRENCH SETS



with Allen-Process Sockets
— Guaranteed Unbreakable

At left: Box Set No. 19, with 9 hex. and 3 square sockets; reversible ratchet or solid wrench; universal joint; long and short extension bars; offset wrench. Price, \$10.00 (list).

At right: Bag Set No. 21-1, with 8 hex. sockets; reversible ratchet wrench; universal joint; extension bar; bent bar; removable adapter; strong, serviceable bag. Price, \$7.00 (list).



Ask just this about a Wrench Set: How strong are the sockets? Are they **cold-drawn**, or merely broached? Are they guaranteed against breakage? — they are if they're really cold-drawn. If they're cold-drawn (ALLEN) sockets, the set is all right. **It will last!**

With Allen-process sockets (in Allen Sets) go worth-while refinements in wrench design and quality of parts. Ask for the Allen booklet, covering these points and carrying prices.

THE ALLEN MFG. COMPANY

135 Sheldon Street,
HARTFORD, CONN.

Pacific Coast Branch Office: The Charles A. Dowd Sales Co., 320 Market Street, San Francisco, Cal.

Chicago Distributor: J. V. McDowell, 6230 Ellis Avenue

Southern Distributor: The Johnson Sales Co., 1429 Candler Bldg., Atlanta, Ga.

Study the PISTON ASSEMBLY

It's the  of an AIR COMPRESSOR

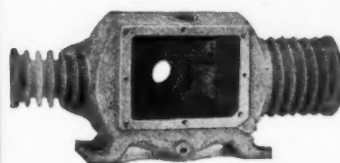
Usaco Rigid Piston Assembly

in a One Piece Casting containing Cylinders and crankcase.



Long, perfectly aligned surfaces. Piston impact distributed largely through yoke.

Single connecting rod with oversize bearings—easily accessible—no possibility of piston slap.



One Casting containing both cylinders and crankcase. Each of the boring, reaming and grinding operations performed on both cylinders simultaneously, insuring absolutely perfect and permanently parallel cylinder walls.

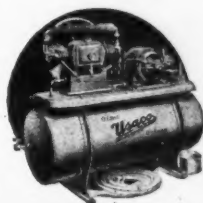
EFFICIENT air displacement depends upon an "air tight" seal between piston and cylinder. When this seal breaks down, because of excessive wear, an air compressor loses efficiency and rapidly depreciates until useless.

Therefore, operating efficiency and length of life depend very largely upon piston design and construction.

The facts herein, comparing exclusive Usaco features with ordinary construction, should be of interest to air compressor buyers. If seriously considered, they will assure the selection of equipment capable of giving the greatest possible length of service with minimum attention and operating cost.

Don't be misled by outer appearances. Buy a Usaco unit, "The compressor embodying many inimitable hidden values." You will then experience many years of top notch service—demonstrating the wisdom of standardizing on these incomparable equipments, as hundreds of others have done.

The
United
States
Air
Compressor
Co.



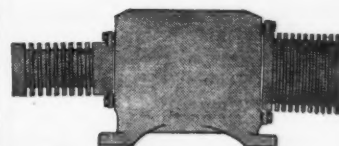
5304
Harvard
Ave.
Cleveland,
Ohio

Ordinary Piston Assembly with Crankcase

and Cylinders in three separate Castings.



(Pistons not held rigidly in alignment—quicker cylinder wear—2 connecting rods with 4 bearings—small bearing in high pressure piston of insufficient size and improperly located.)



(With three parts, all machined separately and held together by bolts—there is greater possibility of misalignment with rapid wear resulting in premature discarding of the compressor.)

Note: Above disadvantages apply to either vertical or horizontal cylinders.



A Tool Safe on the Running Board

A pressed sheet steel tool box equipped with a Yale lock—sturdily built and finished in hard baked black enamel.

Of the same high quality as the Victor line of lamp accessories—not of the tinny variety.

Carry the Victor stock and it will carry you to bigger, better, more profitable business.

This box, No. 622, is 7 1/4 in. high and 22 in. long. The No. 822 is identical, except 2 in. higher.

No. 625 is 7 1/4 in. high and 25 in. long and No. 812 is 10 1/2 in. high and 12 in. long. All of convenient width for the running board.

Send for the new and complete Cincinnati Victor Catalog.

THE
CINCINNATI VICTOR
COMPANY

714 Reading Road
CINCINNATI, OHIO

Victor
TRADE MARK

Owners, by purchase, of the Jobbers' Division of the Corcoran-Victor Co.

ATLAS RADIATORS for FORDS

The Atlas special tube construction gives four times the cooling area and three times the water capacity of the tubular type.

Because of this increased cooling area there is no overheating in summer and in winter the brass core will expand with freezing water—it will not burst.

The backbone feature is a heavy steel bar across the back face and up the sides, forming an extra strong supporting bracket for the radiator and a reinforcing member for the frame.

FITS THE FORD SHELL

The Atlas core is a money-saver because it fits into the original shell. A feature that appeals to the car owner.



Big Sales and Big Profits

Because of its superior features the Atlas is a big seller all year round.

The sales come easy and each sale nets an attractive profit because the dealer discount is big.

Your Jobber stocks Atlas radiators and can make ready delivery. Ask for details today and get in on these money-making sales.

"The Radiator with a Backbone"

The Steidle Manufacturing Co.
CINCINNATI, OHIO



Handy Ben
TRADE MARK
"1 pound Grease Pump"

HANDY BEN Grease Pumps get 40 to 100 pounds more out of the barrel than any other pump on the market and we have never had to replace a stripped gear rack or pinion. Light or heavy grease,—it makes no difference—Handy Ben Pumps handle them in any weather.

Grease Pump \$12.50. Visible Oil Pump \$14.75. Barrel Truck \$6.50. Order one of each on trial at my risk.

Bennett Injector Company

Inventors and Manufacturers of
Grease and Oil-Handling Devices
MUSKEGON, MICHIGAN

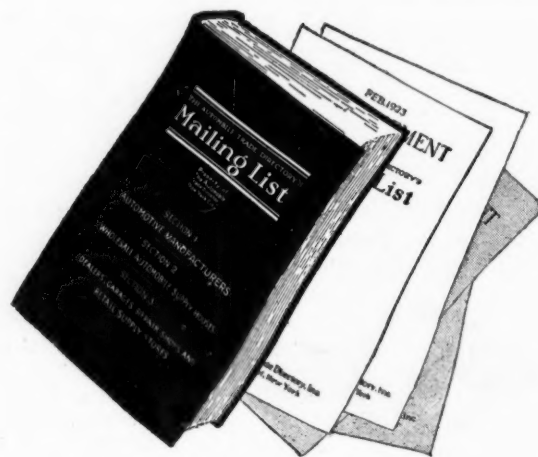
Bennett
PRESIDENT

SPECIAL TRIAL OFFER

Bennett Injector Company, Date.....
Muskegon, Michigan.
Without obligation on our part, ship to.....

City and State.....
Model 6 Grease Pump
Model 8 Visible Oil Pump
Handy Ben Truck

If these pumps fail, in any respect, to perform satisfactorily within thirty days from date, we are privileged to return them without any obligation whatsoever.



Every Sales Prospect in the Automotive Industry

The Mailing List of The Automobile Trade Directory is a complete roster of the individuals and concerns who buy and specify or authorize the purchase of practically everything that is used in the manufacture and maintenance of automotive vehicles.

The manufacturing, jobbing, retail and service fields are covered by the three sections into which this List is divided. For direct circularization, for planning the work of salesmen and for reference purposes this Mailing List is indispensable.

Send for specimen pages and details.

THE AUTOMOBILE TRADE DIRECTORY
239 West 39th St., New York

Meilicke Signals

Extra Profit In This One

It is three lights, all in one neat unit. Though it sells for a little less than all three separately, you get a better profit than if you made the three distinct sales.

It contains a tail-light, a powerful white backing light and the Meilicke lucky horse-shoe shaped stop-signal. Three real necessities. The backing light alone pays for the whole assembly by preventing jimmied fenders when backing into a garage, or by keeping the car from sticking in a muddy ditch.

Back-Stop is only one of a large family, all profitable, and suited to every motorist's needs. You can't help but sell one, no matter what is asked for. Get a description of the whole line, and the generous discounts from your jobber.

Back-Stop

with Tail Light



Check-Lite

When the signal shows, so does Check-Lite. The driver never takes a chance. This feature is original with Meilicke Signals, and makes them sell every time.

Because so much trouble has been found in stop-signal switches, we have invented a fool-proof switch which we include with every Meilicke Signal. But we still add Check-Lite also, as wires will get watersoaked, or chafed, and cause failure of the best mechanism.



MEILICKE CALCULATOR CO.
944 WRIGHTWOOD AVE.
CHICAGO ILLINOIS

Examine the Construction of Huetter Gear Teeth



Write today for
Catalog List!

Notice that each tooth is accurately machined to *Bendix Drive specifications*. Positive, easy, quiet meshing is assured. The teeth are chamfered on BOTH sides, allowing the same ring to be installed no matter which side the starter pinion enters.

"Huetter Gears Are Better Gears," made of hard, tough steel, electric welded at the seam. Battering and chipping is impossible.

When you install a Huetter Gear your customer will show his appreciation by sending his friends to your place for repairs and accessories. Order direct, specifying jobber. Ask for our catalog.

Huetter's Fly-Wheel Gear Bands

HUETTER MACHINE & TOOL CO.

546 Kentucky Avenue, INDIANAPOLIS

Rie Nie

PATCH

The name Rie Nie on the patch you sell is recognized by motorists everywhere. For years the well known Rie Nie Patch has been a foremost seller in the well known line of Rie Nie Automotive Products.

On dealers' shelves the Rie Nie Patch has won through steady, certain sales a name for profit-making auto merchandise.

Ask your jobber—or write direct

DURKEE-ATWOOD CO.
MINNEAPOLIS, MINN., U. S. A.



Now is the Time to Prepare for Xmas Business!

Here is the golden opportunity to cash in on the leader among gifts, Benzer Flower Vases.

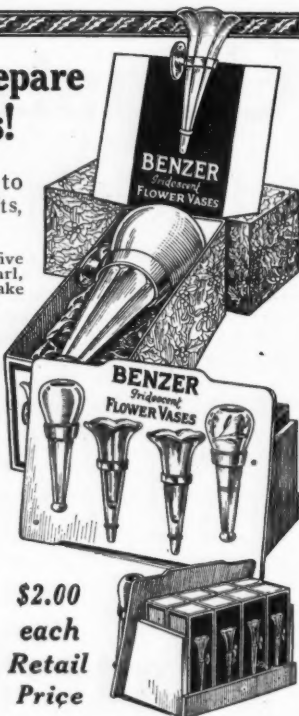
They are made of finest art glass in five attractive colors: Canary, Gold, Pearl, Blue, Green; also Cut Glass. They make such a valued addition to any closed car that they sell on sight.

BENZER

Gridescent

FLOWER VASES

To help you sell them quickly, we will send you this striking display cabinet, *FREE* with your order for 12 vases, handmade, of hardwood, and is 11 inches high by 15 long. Takes but a little room—holds twelve vases. Each vase is packed in a neat, green box with special removable Holly wrapper for holiday selling. Set it up, and you have another catchy little selling help.



Ask your jobber. He has them!

THE BENZER CORPORATION
Myrtle and Cooper Aves., Brooklyn, N. Y.

"Something for the Car
for Christmas"

BENZER
AUTOMOTIVE
GLASSWARE

WHY

experienced automobile
mechanics prefer the

EVER-HOLD

ONE PIECE—quick
ADJUSTABLE HOSE CLAMP



BECAUSE—

there are ten good reasons:

1. They are assembled, rolled up and ready to apply.
2. They have no surplus length to cut or break off.
3. They can be made smaller or larger.
4. They take only a few seconds to apply or remove.
5. The nut and bolt never has to be removed.
6. The nut and bolt is riveted together to prevent loss.
7. They are made of high-grade steel or brass.
8. They are rust-proof, practical and unbreakable.
9. Two sizes are all that are needed in the garage.
10. They are guaranteed by the Vitek Mfg. Co., of Omaha, Nebr.

The pioneer manufacturers of high-grade, one-piece, quick adjustable hose clamps that are used the world over.

VITEK MANUFACTURING COMPANY

Industrial Bldg.

Omaha, Nebr.

NOTICE TO DEALERS: The jobber can supply you with Ever-Hold hose clamp. If not, write direct to us. There is money in selling our clamps—besides they sell fast and none of them come back.

Stafford's AUTO PRODUCTS



A Novel Selling Method Bound to Interest You

RENOL and its companion specialties are being sold by a novel method that gets results—not sometimes but every time. Ask us about it and about our two remarkable propositions for jobbers and dealers.

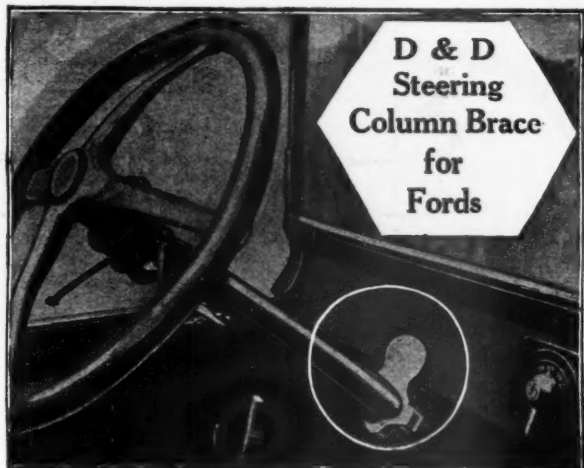
Write for full particulars
about the Stafford Line

Made by the manufacturers of Stafford's Inks and backed by a reputation of 65 years' standing, the Stafford Line includes these fast-selling products:

Renol, the Creamy Polish
Gasket Cement
Gasket Shellac
Penetrating Graphite Oil
Radiator Stop Leak
Black Liquid Tire Cover
Auto Cushion and Top Dressing

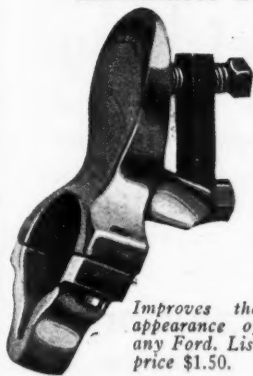
Generator and Magnet Oil
Carbon Remover
Cleaning Fluid
Metal Polish
Neatsfoot Oil
Rapid Tar Remover
Rapid Repair and Engine Enamel

S. S. Stafford, Inc., 607 Washington St., N. Y.



**D & D
Steering
Column Brace
for
Fords**

Eliminates Steering Post Wobble

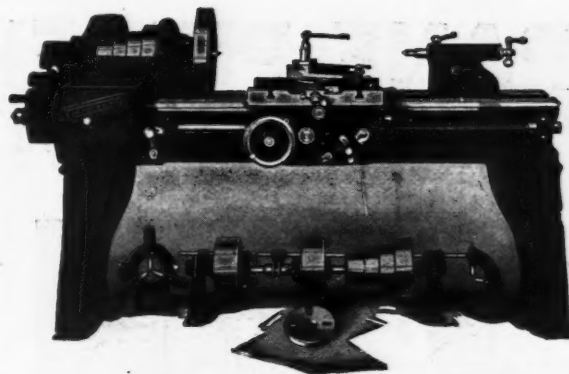


Improves the appearance of any Ford. List price \$1.50.

Over 150,000 Ford owners are using the D & D Steering Column Brace to keep the steering column from vibrating. It makes the steering column absolutely rigid and makes driving more comfortable over rough roads.

Made of a special alloy of aluminum and steel with a beautiful nickel finish. Can be installed in two minutes without any drilling of holes or special tools. Ask your favorite jobber to send you a dozen of these braces, put them on display and you will get a quick turn-over.

Manufactured by
L. H. DALEY & CO.
Columbus, Ohio



**Biggest Lathe
Value Today**

\$450



A genuine Carroll & Jamieson 15-inch quick change double back-gear, engine lathe complete with countershaft, two steady-rests, and two face-plates, designed especially for use in garages and service stations. Price now only \$450. Has 32 changes of feed and thread. 9 spindle speeds from the 3-step driving pulley. Everything so simplified that average garage mechanic can operate it and do a first-class job. Although this lathe is rated 14-inch swing, the actual swing over the ways is 15 1/4 inches.

There is as much difference in the quality of lathes as there is in cars. You know quality in cars—see that you get it in the lathe you select.

13", 15" and 16" sizes—5 to 12 foot lengths of bed. Twenty years' experience back of every C & J Lathe. Get your catalog and latest Discount Sheets.

Carroll-Jamieson Machine Tool Co.
BATAVIA, OHIO



Introducing
CLEARSITE



CLEARSITE
THE DOLLAR WIPER

a new windshield wiper. It fills the gap between the low priced and the best.

Fits all open or closed cars and requires no tools for installing.

This is worth your investigation.

The most complete line of windshield wipers manufactured.

RETAILS
\$1.00

Clear Vision\$.50

Raino\$1.50

Clearsite 1.00

Kleanall 2.50

All are wonderfully efficient. Write us today.

AMERICAN AUTOMATIC DEVICES CO.
CHICAGO

DISTINCTIVE APPEARANCE
of
FOSTER PISTONS
PLEASES THE TRADE

CARS



Their

AND TRACTORS

Impressive Performance
Pleases the User

We can give you 24-hour service

FOSTER-JOHNSON REAMER CO.
1052 Beardsley Ave. ELKHART, IND.

CRANE PULLER

Gets 'Em All



The most stubborn wheel lets go when the Crane Puller is used. No fear of breakage—the Crane design and Crane materials make these pulling tools more than equal to their job.

Arms drop forged from high carbon steel, screw case-hardened with inserted tool steel point.

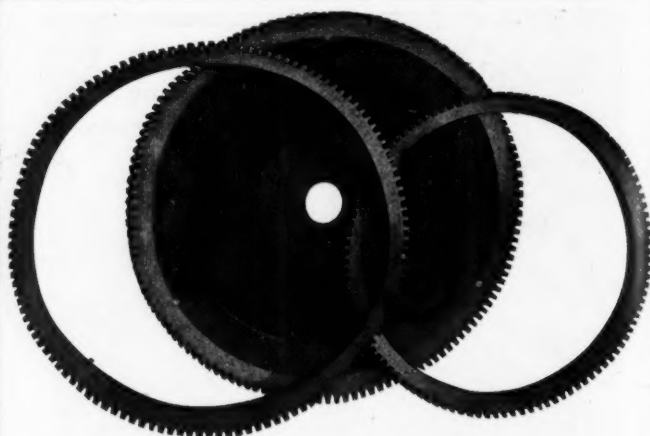
Three models, including the new universal Two-arm, Three-arm Crowfoot model, 4 sizes of each. Real tools for busy mechanics.

Our 24-page folder gives you the whole wheel-puller story. Write for it.

CRANE PULLER CO.

Arlington

Mass.



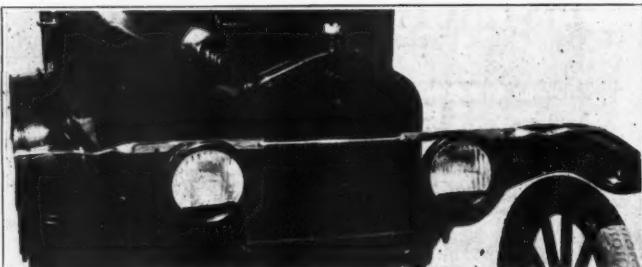
New Low Prices On Fly Wheel Rings

Increased quantity production has enabled us to get out a new and lower price list on Meachem Steel Gear Rings for Fly Wheels. Also our trade discounts have been increased to more than offset the lower list prices. Write us for the new list and discounts.

The Meachem Gear Corp'n.

Ring Dept.

Syracuse, N. Y.



MELTON FENDER BRACE FOR FORDS

Holds the fenders firmly in place and stops rattles. Prevents fenders from sagging and cracking. Every Ford needs them. Fit both front and rear. Installed by anyone in ten minutes. Prices: nickel plated, \$2.75. Black enamel, \$1.75. Liberal discount to dealers.

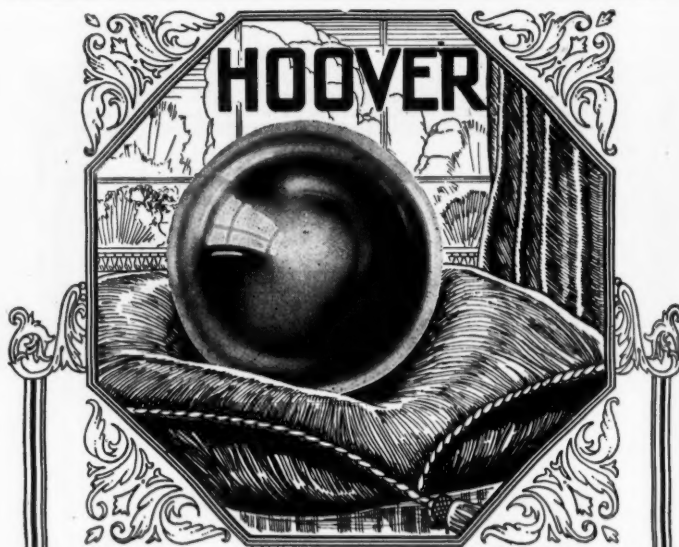
Jobbers Wanted

MELTON FENDER BRACE CO.

Clovis,

305 North Pile

New Mexico



The World's Largest Ball Plant

STEEL • BRASS • BRONZE

MONEL METAL

BELL METAL

ALUMINUM

and

HOLLOW BALLS

HOOVER STEEL BALL CO.

ANN ARBOR, MICHIGAN

Keep Your High Priced Service Men on Profitable Repairs

SHOCK ABSORBER
SERVICING IS COSTLY
AND UNNECESSARY

if the absorber you sell is
assembled and manufac-
tured properly.

You will find the

LOMAR
SHOCK ABSORBERS

the simplest, most effec-
tive absorbers you have
ever seen.

Send for our booklet and look
over their construction.

It will interest you.

The
Lomar Manufacturing Co.
Middletown, Ohio



A Gasket Paper That Saves You Money



Every Shop Can Use Adpasco

Adpasco Treated Gasket Paper is needed in every shop for every use except in contact with extreme heat. Don't use expensive packings where Adpasco can be employed in an efficient manner. Adpasco will save you money.

Is Treated—will not rot out and crack like ordinary paper makeshifts. Soft, pliable, holds its shape.

Size 36x40 in. Sold by over 400 jobbers. Used daily in thousands of shops.

Advance Packing & Supply Co.

66 E. Lake Street

Chicago, Ill.

Pac. Coast Distributor: Allied Industries, Inc., San Francisco, Los Angeles, Seattle

Increase the EARNING capacity of your garage

by using DICKERSON Turntable and Service Jacks. Cars moved instantly—easily. Spring replacements and chassis repairs made in much less time—raises car frame by any fraction of an inch, making bolt holes line up perfectly. Works where no other jack will—does work impossible with others. Mechanism like heavy truck drive. Handles all cars—bumpers, trunk racks, etc., do not interfere. One man easily raises heavy truck.

Write for catalog. Some valuable territory open for "live jobbers."

C. A. Dickerson Compressor Corp.
220-222 Chicago St., Buffalo, N. Y.

DICKERSON
GARAGE JACKS
AIR COMPRESSORS
SHOP EQUIPMENT



Turntable Jack No. 11

They Want Crescent Tools

First-class cars should have first-class tools and car owners know it. That's why so many of them buy Crescent outfits if Crescent Tools don't go with the car. Crescent-equipped cars build prestige and good will for manufacturer and dealer alike. Incidentally every completely stocked accessory department carries Crescent wrenches, Crescent pliers and Crescent screw-drivers.

Crescent Tool Company
"The CRESCENT WRENCH People"
Jamestown, N. Y.



CRESCENT TOOLS

DELUXE Products
For the "Jobber" Customer



A shining example
of the economy
of quality

Only \$3.50 Retail

ORDER DIRECT
SPECIFYING
JOBBER

**The
DeLuxe
TIRE PUMP**

Also
ARVIN HEATERS
DE LUXE,
DELUXE VENTILATORS

INDIANAPOLIS PUMP & TUBE CO.
INDIANAPOLIS

**The JOHNSON No. 101
Bench Furnace**

For Soldering
Metal Melting
Heat-
Treating

Requires
No
Forced
Air
Blast



Write for
Catalog

JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA



The Bearings Company of America—Manufacturers of Angular
Contact Radial Bearings, Angular Contact Thrust Bearings,
Thrust Ball Bearings.
Bearings made to your B/P's and requirements.
Your present Bearing sizes duplicated.

The Bearings Company of America
Lancaster, Penna.

Detroit, Mich., Office,
1012 Ford Bldg.



**Don't Use Dangerous Acids—
Play Safe with "Ruby Fluid"—**



A complete substitute for dangerous acids,
Zinc Chloride, Sal ammoniac and other mix-
tures commonly used as a Flux. Ruby Fluid
is quick acting, anti-rusting and is always
ready for instant use. Ruby users include
the foremost industries of the country.

Send for generous Free Sample.

Rubyfluid
TRADE MARK REG.

COMBINATION
SOLDERING AND TINNING FLUX

For All Metals

THE RUBY CHEMICAL CO.
68-70 McDowell St. Columbus, O.

PARANITE CABLE
Best for Automotive Work

We carry at all times a complete stock of every kind
of cable used for automotive work. Many years of spe-
cialization have brought **PARANITE** Cables to the high-
est state of perfection. The finest grades of rubber
compound, cotton and flexible enamel varnish are used.

**FOR 33 YEARS THE STANDARD
IF IT'S PARANITE IT'S RIGHT**
Quality jobbers handle quality cable—
that's **PARANITE**.

Indiana Rubber & Insulated Wire Co.
810 Marquette Bldg., Chicago
Factory and General Offices—Jonesboro, Ind.



EXCELSIOR TEST BENCH
With the Positive Drive and Speed Control



**INCREASE
YOUR PROFITS!**
Starting, lighting and
ignition pays bigger
profits than any
other branch of
automotive service.

**The Excelsior
Test Bench**
equips your shop com-
plete for this work.

Price \$385.00
Payable \$50 per month
Write for bulletin 975M

WEIDENHOFF 4350 ROOSEVELT ROAD
CHICAGO, ILL., U.S.A.

**ARG REAR
BRACE**

Makes Your "Ford" Last Longer

Made of selected material, handsomely finished, easy to
put on, long wearing; costs only \$2.50.
ARG braces—front and rear—take all the rattle out of
your fenders; keep them from sagging and cutting the
tires; and add much to the appearance of the car.

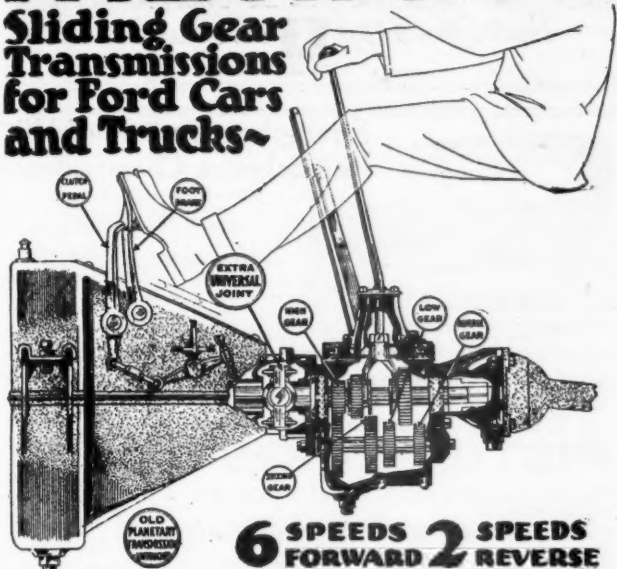
DEALERS: Write for special terms with liberal
discounts.

ARG Auxiliary Spring Co. Birmingham, Ala.
Address Dept. 4



MOHAWK

**Sliding Gear
Transmissions
for Ford Cars
and Trucks~**



Converts the Ford car or truck into a standard machine with selective type gear shift, 3 Speeds Forward and One Reverse or 6 Speeds Forward and Two Reverse at driver's option. The MOHAWK can be installed with ordinary tools in six hours. It eliminates planetary troubles. Increases speed and power. It is **GUARANTEED FOR LIFE OF CAR OR TRUCK**. Write for full description and prices. **DEALERS:** Ask about territory still open.

The Mohawk Corporation. Dept. M, Rockford, Ill.



If you're tired of tired spark plugs, there's a remedy. If you're sick of nursing along an engine that has a sickly cough, there's a cure.

Just notice that whenever you put in a plug with "775" marked on the insulation, it lasts much longer.

"775" is a manufacturer's mark. You'll find it on the insulation of practically all the best spark plugs. It doesn't add to the price, but makes a world of difference in the performance.

FRENCHTOWN PORCELAIN CO.
Trenton, New Jersey

*"Established in 1910—
Busy Every Since"*

STANDS THE TEST

ACCURATELY MACHINED **SEMI-STEEL REPLACEMENT PISTONS** ACCURATELY MACHINED



For replacement work after a rebore or re-grind job insures your customer as good if not a better job than the original assembly.

Dall Pistons are simply **GOOD** Pistons, made to manufacturer's specifications, sometimes more refined in design and lighter in weight, but always as carefully made and inspected as though they had to pass the most rigid inspection of a Motor Manufacturer.

Dall Pistons are regularly furnished in standard and various oversizes, also semi-finished 1/16 oversize.

Write today for price list and delivery schedule on all items. Distributors at various points will take care of your requirements.

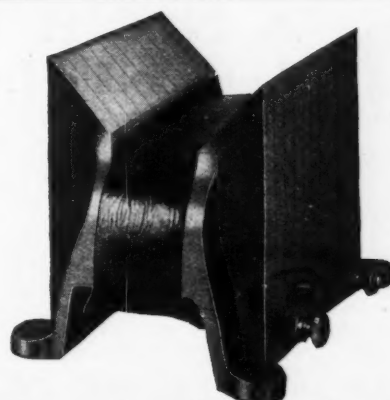
THE DALL MOTOR PARTS COMPANY

Post Office Station D, Cleveland, Ohio

Southwestern Branch

THE CARROLL CO.

2218 S. Harwood St., Dallas, Texas



This Growler Costs But \$4.50

With it you can tell in ten seconds whether an armature is in good condition. If it is not, you are saved all the grief of having to do the whole job over, losing all your profit and the customers' goodwill besides. Operates on 110 Volt A. C. Current.

Sold direct or through your jobber. Resale price \$4.50 in Central and Eastern States, \$5.00 in Pacific States. Your check for above amounts plus twenty-five cents postage brings this moneymaker to you.

ARMATURES: We rewind any and all kinds of GENERATOR, MOTOR and MAGNETO armatures, and reship same day old armatures received.

FORD GENERATOR AND MOTOR ARMATURES.....	\$ 1.50
ALL SMALL DOUBLE UNIT GENERATOR AND MOTOR ARMATURES.....	5.00
SINGLE UNIT MOTOR GENERATOR ARMATURES.....	10.00
MAGNETO ARMATURES.....	\$3.75 to \$4.75

Armature Rewinding Co., Inc.

3537 BELL AVE., ST. LOUIS, MO.

After Sept. 15th, in New Factory 3301 Washington Blvd.

The User's Battery— The Dealer's Battery

The battery that gives service to the customer is the battery that the wise dealer handles. And the Dragon has always given remarkable service. A liberal discount for the dealer. Better look into this Dragon proposition.

Write or wire

Englert Manufacturing Co.
Pittsburgh, Pa.

Dragon Storage Battery

Seven body types—\$1295—\$2250

STEPHENS

Finer Motor Cars  At Lower Prices



Strengthen Your Ford With the Scholtes Chassis Brace

Prevent Costly Repairs. Distribute the Shocks. \$12 a Set—Parcel Post Prepaid in U. S. A.

State Representatives Wanted—Write Us

Chassis Brace Co., Inc.
Dept. M, Mobile, Ala.

FORD OWNERS

HERE'S MORE POWER—MORE SPEED

THREE-SPEED Transmission

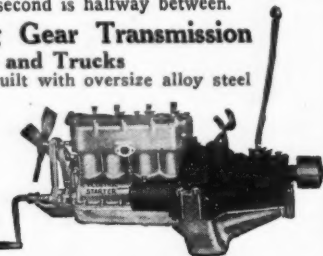
This transmission has three speeds forward and one reverse and replaces the regular Ford transmission, drums, bands and all. The low gear is lower than the Ford, therefore more power, third or high is the same as the Ford high and second is halfway between.

Cronk Simplex Sliding Gear Transmission For Ford Cars and Trucks

This transmission is ruggedly built with oversize alloy steel gears. Multiple disc clutch. Foot brake on jack shaft outside of case. Hyatt Roller and Genelite bearings. Installation easy. No cutting or machining.

Write today for other interesting details.

E. D. & A. F. Cronk, Inc.,
140 Hotel St., UTICA, N. Y.



WEL-EVER OIL PISTON RINGS

Less Oil and Gas—from WEL-EVER equipped units. Its oil control feature is guaranteed to stop oil pumping, prevent spark plug fouling and reduce carbon formation.

Write for interesting circular on oil pumping and details about this fast selling piston ring.

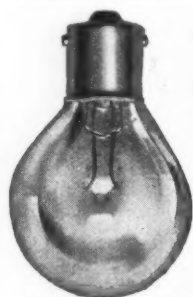
THE WEL-EVER PISTON RING CO.
1713-15 Canton St. Toledo, Ohio

“CONNEAUT” Plastic Metallic Packing

Patented

Stops the leaks in automobile water pumps. Mold it with your fingers. Makes a smooth metal bearing—adjustable and practically frictionless. At your Jobber—Get it today. It does the trick. Put up in 1 lb. cans. If your Jobber doesn't carry it, write us direct. Price \$1.65 per pound, f. o. b. Conneaut, Ohio.

The Conneaut Packing Company Conneaut, Ohio



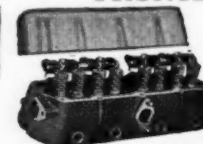
ANCHOR Automobile Lamps

You profit more by selling Anchor lamps. Seven years of close study and experience is in their design. The materials in them are the best the market affords. They give good, long service without complaints or make-goods. Our low manufacturing and selling costs allow you to make an extra margin of profit.

A sufficient stock of Anchor lamps requires small investment, and is cleaned out quickly by the constant demand. Jobbers and dealers both make money on the trouble-free Anchor line. Send for size and price lists with generous discounts.

ANCHOR ELECTRIC CO.
157 W. JACKSON BLVD. CHICAGO, ILL.

FRONTENAC CYLINDER HEADS and FRONTY-FORDS



The remarkable showing of the Fronty-Ford in the 500-Mile Race at Indianapolis May 30 was due solely to the performance of the Frontenac Cylinder Head. This Head is adapted for use on your Ford car by its designer and builder, Arthur Chevrolet. Write for FREE Catalog. Book, "How to Build a Fronty-Ford," \$2.00; free with orders of \$50.00 or more.

CHEVROLET BROS. MFG. CO., 410 W. 10th St., INDIANAPOLIS



THREE PRODUCTS YOU NEED

ZIP FRICTION PASTE, for fitting in bearings.
ZIP GRINDING COMPOUND, for valves.
ZIP LAPPING COMPOUND, for lapping in pistons.

The Original Write For Samples Ask Your Jobber.
Water Mixed. **THE ZIP ABRASIVE COMPANY** Cleveland, O.
U. S. Pat. 1353197 **THE ZIP MFG. CO.** Denver, Col.

PISTON RING REMOVER

Repairmen, Chauffeurs and Car Owners have long been looking for this tool, "Wonderspread."

You just use it—as you would use a pair of pliers—grip the ring and spread it—all one motion.



C. T. THOMAS
Sole U. S. Distributor
160 Broadway, N. Y. **\$2.50**
Ask Your Dealer
WONDERSPREAD

NO-LEAK-O PISTON RINGS

Won't Leak Because They're Sealed With Oil



No-Leak-O Piston Rings are making money for dealers everywhere. Their "oilsealing" groove—found only in No-Leak-O—packs an oil film in between piston and cylinder walls like "packing" in a pump. Oil and gas stay where they belong. National advertising is helping the dealer sell No-Leak-O by teaching the motorist the lesson of more mileage on less oil and gas.

It will pay you to stock No-Leak-O at once.

Price 50c and up.

NO-LEAK-O PISTON RING CO., Dept. T-57, Muskegon, Mich.

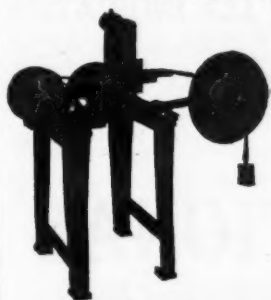


Textolite TIMING GEARS

A General Electric product. Made entirely of cotton fabric processed to wear like iron. Eliminates all noise from the timing gear assembly. For practically all cars. Write for prices.

JOHN C. HOOF & CO.
157 W. Illinois St. Chicago

MR. RADIATOR REPAIRMAN



Make your own radiator cores and save 20% to 50% of their cost, give your customers quick service and a better core for less money. No need to carry large stocks of cores, and no damage in shipping. Increase your volume of business. Send for illustrated booklet describing our radiator core equipment.

Write for information to

Radiator Engineering Co.

626 Nesselwood Ave.

Toledo, Ohio

You Can Make \$38.00 on a \$58.00 Cylinder Job

Using a Stormizing Machine. This profit is NET, above all labor, cost of new pistons, rings, overhead, everything. Ask us to send you our book on Stormizing Machines. Made in all sizes for all shop needs.

STORM

MANUFACTURING CO.
406 A Sixth Ave. So.
Minneapolis



PAROB EXPANSION HAND REAMER

BLADES CUT AT
DIFFERENT ANGLES

Each successive blade cuts AT A DIFFERENT ANGLE from the one before it.

No CHATTER,
no DIGGING IN—
even in keyed holes.

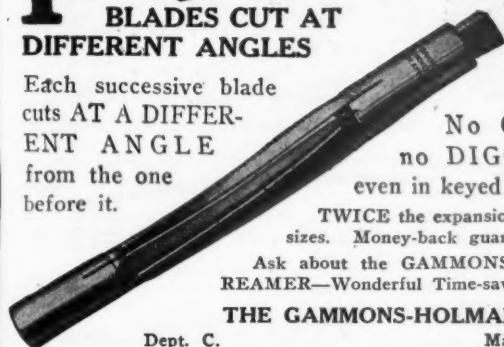
TWICE the expansion of others. All sizes. Money-back guarantee.

Ask about the GAMMONS TAPER PIN REAMER—Wonderful Time-saver.

THE GAMMONS-HOLMAN CO.

Dept. C.

Manchester, Conn.



Re-Babbitted Bearing Exchange

We Re-babbitt any Automobile, Truck or Tractor Connecting Rod or Main Bearing with HIGHEST GRADE NICKEL BABBITT and finish them regular Factory sizes. All work guaranteed satisfactory or money refunded in full and transportation paid both ways. All RUSH Orders shipped same day order arrives.

We shipped over 100,000 Bearings last year. Over 5000 satisfied Dealers and Garages will recommend us. Save one-third to one-half your Bearings costs by sending us your work. Ship Parcels Post or Freight. We sell wholesale only.

Fremont Foundry & Bearing Works
Oklahoma City—U. S. A.

Send For Our

NEW PRICE LIST

Our new catalogue just off the press gives reduced prices on our reliable line of battery plates and parts. You can now get these high-quality plates at about the same price as ordinary plates. You can guarantee our products, and your guarantee will stand up.

GENERAL STORAGE BATTERY CO.

2005 Locust Street, St. Louis, Mo.

READY—State, County and Town Lists

12,000,000 Passenger Car Owners
5,000,000 Ford Owners Only
2,000,000 Truck Owners
190,000 Motorcycle Owners
3,500,000 Farmers Owning Cars

Automotive Trade Lists — Garages, Dealers, Battery Stations, etc.

Statistics — reliable and of practical value

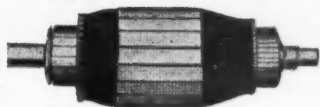
Send for our Free Book, "Automotive Markets" which contains valuable data for you

Direct Mail Department

The REUBEN H. DONNELLEY CORPORATION
334 E. 21st Street : : : : Chicago, Illinois

ARMATURE REWINDING

One Trial
Makes You
a Customer



Work and
Service
Guaranteed

Note Our Prices

Generators, all makes.....	\$3.25
Liberty Fords.....	\$1.50
Starting Motors.....	\$1.50 to \$ 7.00
Motor Generators.....	\$5.00 to \$12.00

Our stock of 2000 armatures, for exchange purposes, insures good service.

A trial order will convince you of the merit of our work

PIONEER ARMATURE CO., INC.

2805 Cottage Grove Ave., Chicago, Ill., Phone Calumet 1076



A Better Motor

The development of this new Waukesha Bus and Truck Motor is a long stride in "heavy motor" efficiency. Its low operating costs builds bigger profits. Write for details.

The Waukesha Motor Company
Waukesha, Wisconsin

BUS and TRUCK MOTORS



INVESTIGATE!

GRAY dealers are selling cars. It will pay you to investigate the complete line of Gray Passenger Cars and the Gray Motor Truck. Write today for details of the Gray franchise.

GRAY MOTOR CORPORATION
Detroit, Michigan



Bosch

The Genuine Original Bosch—Robert Bosch Products—hold records the world over. Send for book of "Facts". Robert Bosch Magneto Co., Inc. The Genuine Original Bosch
Otto Heins, Pres., 123 West 64th St., New York



JARVIS WATER INDICATOR

Prevents trouble due to lack of water. Warns of other danger before it grows serious. When the water gets low so does the red spot. When the water boils, the red spot jumps. Only one moving part. Moderate price, large profit, easily sold. See the Jarvis Water Indicator on the new Maxwell Sport Model. WRITE FOR PROPOSITION.

W. B. JARVIS CO. Grand Rapids, Mich.

INTERNATIONAL MOTOR TRUCKS for low-cost hauling

Models range from the 2,000-lb. Speed Truck to the 10,000-lb. truck. Some territory is still open for dealers.

International Harvester Company of America
(Incorporated)
Chicago, U. S. A.

Ask
Us About
Our Cylinder
Internal and
Surface

Grinders



MAGNETIC CHUCKS

HEALD MACHINE CO.
61 New Bond St.
Worcester, Mass.



Noiseless Timing Gears

Install quietness—Cloyes NOISELESS Timing Gears. They give the motor a soft, even "purr"—permanently.

Cloyes Gear Works
1614 Collamer Ave., Cleveland, O.

Sales Representatives
United Autoware Co., Flak Bldg., New York City
N. Loewenthal, Box 952, Ft. Worth, Texas

VULCAN

The Replacement Spring
JENKINS VULCAN SPRING CO.

Factory: RICHMOND, INDIANA

BRANCHES: Boston, Mass., 819 Boylston St.; Dallas, Tex., 2216-18 Commerce St.; St. Louis, Mo., Main and Cedar Sts.; San Francisco, Cal., 1035 Folk St.



Air Compressors; Gasoline and Oil Storage Systems; Heavy Metal Storage Tanks; Oil Burning Systems; Furnaces and Forges; Oil Filtration Systems; Water Softening Systems.

WAYNE TANK & PUMP COMPANY,
706 Canal Street, Fort Wayne, Ind.

Wayne

bethlehem betterments

Utilities—Not EXCESSories!

Jorgensen Door Silencers

For Dodge Sedan (all models), Dodge Coupe (1922 and earlier). Hold doors with a vacuum grip; prevent rattling and noisy banging, tough resilient black rubber. Easily installed. Write for prices, etc.

JORGENSEN SPECIALTY CO., Erie, Pa.

Motor Wheel PRODUCTS

Motor Wheel Corporation, Lansing, Michigan



For information about the
Durant and Star Car selling
franchises write

DURANT MOTORS, Inc.

560 Jackson Avenue,
Long Island City, N. Y.



DIAL GAUGES

When you find Ames dial gauges in the finest automotive shops, on close limit work — there's a reason. Let us tell you why. Write TODAY.

B. C. AMES COMPANY
Waltham, Mass.



PATENTS

Send sketch or model today for examination and report, Record of Invention blank on which to disclose your invention and new guide book, "How to Obtain a Patent," sent free. Promptness assured. Highest references. WRITE TODAY. CLARENCE A. O'BRIEN, Registered Patent Lawyer, 210 Southern Bldg., Washington, D. C.

KING QUALITY PISTON PINS

Automotive Division
KING SEWING MACHINE CO.

Buffalo, N. Y.

Bridgeburg, Ont., Can.

BOWSER

ESTABLISHED 1885

ACCURATE MEASURING PUMPS

S. F. Bowser & Co., Inc.

Home Plant, Fort Wayne, Indiana

THE GRAND PRIX CAR
DUESENBERG
Original Straight Eight

Duesenberg Automobile & Motors Co., Inc., Indianapolis

Piston Pins **TRINDL** **and Valves**

Oversizes **Standards** **Specials**
Prompt shipment, highest grade materials, precision accuracy to closest dimensions and unexcelled workmanship. Send for specification and price lists—they make pin and valve buying simple.
THE TRINDL CO., 2917 Wabash Avenue, Chicago, Ill.

FISK TIRES

There's a Fisk Tire of extra value in every size, for car, truck or speed wagon

GRINDING
MACHINES

BORING
MACHINES

LANDIS

LANDIS TOOL COMPANY

WAYNESBORO, PA.

NEW YORK OFFICE:
51 Chambers St.

Kelso

BRAKE LININGS and CLUTCH FACINGS

Always used where safety and service are the first and only consideration.

KELSO M'FG CO.,

TRENTON, N. J.

CYLINDER HONES

Can be operated without removing engine from vehicles. An absolutely true hole. Small first cost. Large profits. Have efficiency of large, expensive grinders.



KALAMAZOO

MICHIGAN

AXLE SHAFTS and SPRINGS

Also Keys, Key Stock and Nuts for all makes of cars and trucks. Write us about Gilliam Bearings

BUTLER AUTOMOTIVE STEEL COMPANY

Easton, Pa. 101 D Street

ATWATER KENT

The World's Highest Grade Ignition, Starting & Lighting.

4957 STENTON AVENUE

PHILADELPHIA, PA.



140 Combinations —all in this ONE set

Everything you need, in one small box, compact, accessible, and a real mechanic's outfit. Sockets will not break. Fully guaranteed. Ask your dealer or write us.

The Eastern Machine Screw Corp.
10-20 Barclay Street, New Haven, Conn.

THE QUINCY SILENT AIR-MASTER

The Most Air Per Dollar Cost

WALL PUMP & COMPRESSOR CO.

Quincy, Ill., U. S. A.

The "UNEEK" and "OTIS" Hose Clamps



are in a class by themselves

OTIS-FLAGG CORPORATION

Main Office and Factory YORK, PENNA.

IT'S EASY TO SELL

"The only oil ring with a mileage guarantee"

"Sav-Oil" is stamped on bottom of every ring

The Sav-Oil Ring Mfg. Co.

1037 S. Figueroa St., Los Angeles



**"The Best-Equipped Shop
Gets the Business"**



**WEAVER
GARAGE
AND SHOP
EQUIPMENT**

**WEAVER
MANUFACTURING
COMPANY
SPRINGFIELD
ILLINOIS
U.S.A.**

Send for Catalog

**Gemco
BUMPERS**

**Bumpers for
all Cars**

The Price and
Quality Satisfy

Complete Catalog on Request

GEMCO MANUFACTURING CO. 760 So. Pierce St, Milwaukee, Wis.

BIG PROFITS CHARGING BATTERIES

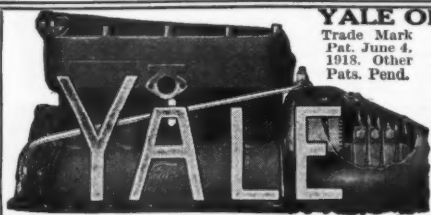
Small Cash Investment—Big Monthly Earnings

Be the first to offer HB 8 hour charging service. Eliminate competitors with old systems taking 2 or 3 days. Get your HB Constant Potential outfit now on 30-day free trial with money-back guarantee. Small cash payment, long easy terms on balance. Write for information to **MOBART BROS. CO.**, Box AR 402, Troy, Ohio.



YALE OILING SYSTEM

Trade Mark
Pat. June 4,
1918. Other
Pats. Pend.



FOR FORDS
Jobbers cash in now on strong advertising and sales campaign. Over 1,000 Ford dealers sell it. Write for discounts.

Roland & Koch
411 S. Main Street
Los Angeles, Cal.
2715 N. Broad Street
Philadelphia, Pa.

WAYNE

VALVE-FACER

Works like a pencil sharpener. No chatter-marks; a finish equal to any lathe job—in a few minutes. Does a real job. Built by **TOOL-MAKERS**. Circular.

WAYNE TOOL MFG. CO.
Waynesboro, Pa.



ALVORD QUALITY TOOLS

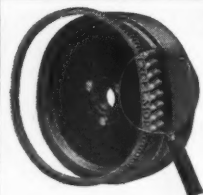


Taps, Dies, Cutters, Drills, Reamers
Send for Catalog

ALVORD REAMER & TOOL COMPANY
Millersburg, Pa.

Better than a new flywheel

"Saves Money—Saves Delay"
For every American Car and Truck



EXCELSIOR STEEL RING GEARS

SPRINGFIELD MFG. CO.
Springfield, Ohio

KISSEL

The Custom Built Car



The Aristocrats of Motordom

7 Models—Open and Closed

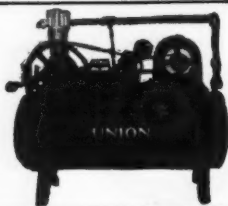
Distributors in principal cities. Open territory now being closed.

Kissel Motor Car Co.
Hartford, Wis.

For Unusual Service

Union Air Compressor, Union for Service, Union for Strength, Union for Reliability. Built by Union Equipment Co., Butler, Pa. The best machine on the market for the money.

Union Equipment Company
Butler, Penn.

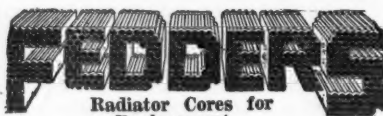


WARNER GEAR COMPANY

MUNCIE, INDIANA



CLUTCHES, TRANSMISSIONS, CONTROLS, DIFFERENTIALS



Radiator Cores for Replacement
Can now be had

FEDDERS MANUFACTURING CO.

Of the Same
Genuine Fedders
Quality

which has made Fedders Radiators standard equipment on America's finest cars.

BUFFALO, N. Y.

KOKOMO
LONG-LIFE
TIRES AND TUBES

KOKOMO RUBBER CO., Kokomo, Indiana
131 South Main St.

Kokomo Long Life tires and tubes make money for dealers who handle them.

Kokomo Twin-Grip Fabrics
Kokomo Two-Grip Cords
Kokomo Everlast Red Tubes
Kokomo Standard Gray Tubes

Every Tungsten Spark Plug Sealed in a Metal Container

"Always On The Job"

Tungsten Spark Plug Co., St. Joseph, Mo.

STUTZ SIX—It's a Great Car



STUTZ Speedway FOUR

America's Pre-eminent Sport Car

STUTZ MOTOR CAR COMPANY of AMERICA, Inc., Indianapolis, Ind.
Builders of the Original and Genuine Stutz Motor Cars

STEVENS TOOLS

SPEED UP



OVER 50 WONDERFUL SHORT CUTS
IN NEW CATALOG T-105

ASK FOR IT

STEVENS & COMPANY
375 BROADWAY, NEW YORK

RELIO

Van Norman VALVO

Relio, an electric-drive wet grinder for pistons, pins, valves, bushings, \$475.00.

Valvo, an electric-drive bench grinder for valves, valve-seat reamers \$175. See page ads this paper.

Van Norman Machine Tool Co.
Springfield, Mass.

TAKE THE END-PLAY OUT!**—WITHOUT PULLING THE MOTOR**

THE C. A. ADJUSTABLE CENTER BEARING CAP corrects Ford crankshaft end play and sets magneto for highest efficiency without removing the motor. Easily and quickly installed. Guaranteed for one year. List price \$3.75. Ask your jobber or dealer or write us direct.

ADJUSTABLE BEARING CO., Inc.
Dept. M. Brazil, Indiana

**ACE aligning gauge—**

An absolute necessity for squaring up pistons and wrist-pins with the crankshaft. Made to real tool-making standards. Complete with 10 precision ground bushings \$25.00, with 2 bushings \$20.00. Ford Special \$16.00. Send for circular. 30 days' trial if desired.

MARK W. JONES

52nd Street & Lancaster Ave., Philadelphia, Pa.



Side Wall Model.

Dash Insert

THE FARGO
ASH RECEPTACLE

It Does Sell for Two-fifty. Get Some!



THE FARGO CO., Inc. 303 Watson St., Ripon, Wis.

The
Coopers

"SPECIAL" Motor Testing
and Carbon Outlet Valve—

COOPER Dash Control

are the Standard of the Industry

Manufactured By **THE COOPER MFG. CO., Inc.**
Dept. 15-C, Marshalltown, Iowa

Sales Representatives, **THE FULTON COMPANY** Milwaukee, Wis.



LINENDOLL EXHAUST
HEATER

Attractive in appearance, with cleaning features of removable heating coil with no connecting joints inside the heater pan to leak. Meets instant approval. No odor or noise. Easily installed and operated. Will boost your winter sales—get our attractive trade proposition.

THE NORWALK AUTO PARTS CO.
Norwalk, Ohio

R&V Knight
SIX

"EVERLASTING PERFORMANCE"

Engine Sealed and Guaranteed for 2 Years

R & V MOTOR COMPANY

East Moline, Ill.

There's a WATKINS Branch Near You

If you want *genuine* Watkins Rebuilt Connecting Rod service, which includes not only rebabbiting the rod to S. A. E. specifications, but equipping the rod with laminated shims, new bronze piston pin bushing and new bolts and nuts, send your old rods to the authorized WATKINS plant nearest you. Rebuilt rods shipped same day they are received.



WATKINS Complete Rebabbiting Service

Equip Your Shop

with
HOYT Electrical Testing Instruments

Burton-Rogers Co., Boston, Mass.

**The Francisco Auto Heater—**

—Made in 60 different models for all makes of cars—heats both closed and open cars. Gives from two to three times as much heat as any other heater.

THE FRANCISCO AUTO HEATER MFG. CO.

Columbus, Ohio

1923—

the largest passenger car sales year in
Pierce-Arrow history

Investigate. Write.

THE PIERCE-ARROW MOTOR CAR CO.

BUFFALO, N. Y.

(265)

WICACO Twin Cut Piston Ring—

With the Wandering
Oil Groove

[pronounced
WICK-A-CO]

WICACO

SCREW & MACHINE WORKS, INC., 4801 Stenton Ave., Phila., Pa.

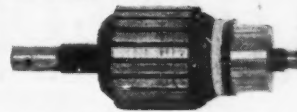


Let "Armature Winding Specialists" Relieve
You of Your "Rewinding" Troubles

Our prices insure your profit.
Fords \$1.95, others in proportion.
Write for them. Quality and
service—all work guaranteed. Re-
wound armature shipped same day
defective one is received.

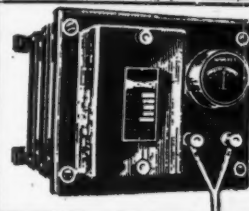
Capacity 1,500 a Day

H. M. FREDERICKS CO., LOCK HAVEN, PA., U. S. A.

**CANEDY-OTTO MFG. CO.**

Manufacturers of Automotive Equipment, Drills,
Punches, Shears, Shrinkers, Countershafts, Grind-
ers, Buffers, Forges, Blowers, Tuyere Irons and
Blast Gates.

Main Office and Factory—Chicago Heights, Ill.
New York Branch—407 Broome St.
San Francisco Branch—952 Folsom St.



Automobile and Radio batteries charged for a
nickel. Ten million car owners and five million
radio fans are prospects for

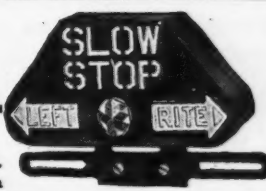
THE
HOMCHARGER

BIG PROFITS. WRITE NOW.

The Automatic Electrical Devices Co.
122 West 3rd St. Cincinnati, Ohio

DIAMOND
Automatic Automobile
SAFETY SIGNAL

Dealers Wanted—Send for Folder
Automotive Signal Manufacturing Corp.
703 Finance Building Philadelphia



PERFECTION
GEAR
COMPANY

1475
Michigan Ave.
CHICAGO

PERFECTION
Silent Timing
GEARS

SILENT
DURABLE
DEPENDABLE

WORLD'S
STANDARD
REPLACE-
MENT



RED GIANT RIM TOOL

The world's most popular tool for changing tires on split rims. Sold in every state in the Union and eight foreign countries. If your jobber cannot supply you with RED GIANT RIM TOOLS do not accept "something just as good" but order direct and send us your jobber's name and address. Dealers price, \$3.25.

RED GIANT TOOL CORP.
Lynchburg, Va.



Wedge-Rite piston rings are 3-piece rings following the best engineering practice. The patented wedge takes up the wear, keeping the groove and cylinder wall tight against oil and compression leakage. Wedge-Rite Piston Rings are made from the best individual castings.

Wedge-Rite

Plattsburgh, N. Y.

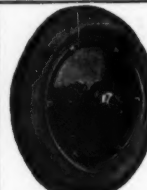


REID AIR SPRINGS

FLOAT THE CAR ON AIR

Promotes smooth, joltless riding by cushioning all road shocks. Positive two-piston action against air pressure and oil. Easily installed and permanent in operation. Big profits for live dealers and distributors.

THE REID AIR SPRING COMPANY
New Haven, Conn.



There is a Harvey Steel Disc Wheel in the various styles which we make for each size of car at interesting prices.



Rim & Wheel Co., Inc.
25 E. Jewett Ave.,
Buffalo, N. Y.



Distributors—Dealers—Agents
One of the best sellers in recent years. Eliminates all eye strain from oncoming headlights, sun glare, and road glare.

THE OPTOSHIELD
Made of sapphire blue scientifically made optical glass. Driver looks right through it. Fits any windshield. Price \$3.50. Write for proposition.

DETRO SALES SERVICE CO.
1647 Penobscot Bldg., DETROIT



RED DEVIL

SELF-ALIGNING BURNISHING MACHINE

Makes it possible to fit over-size pistons without removing engine from the car when the variations do not exceed 5/1000 of an inch. Cylinders slightly tapered, out of round, or with shoulders worn by pistons or rings may be made round, straight and true. Price \$25. 12 ounce can Red Devil Compound, \$1.50. Write for complete details.

MID-WEST MFG. CO. Minneapolis, Minn.



CHANNON HEATERS

INVESTIGATE NOW FOR FALL and WINTER BUSINESS

Manufacturers Channon-Hughson Co.
229 W. Erie, Chicago, Illinois
Sales Department The Zinke Co.
1323 S. Michigan Ave., Chicago, Ill.
Write our Sales Department for full details.



UNIVERSAL HOSE CLAMP

Adjustable. Two sizes will clamp any hose of any diameter. Made from cold rolled steel out of wire. No rough edges to cut hose. Put on in less than a minute. Everlastingly leak-proof. Order Universal Hose Clamps. Trademark on every clamp and carton. Get them from your jobber—or write us.

UNIVERSAL INDUSTRIAL CORP.

Hackensack, N. J.



Monogram Light Distributors

Standard equipment on 114 of America's foremost cars and trucks.

Pass I. E. S. rules and all state tests.

MONOGRAM LENS CORPORATION
52 Vanderbilt Ave. New York



Be the local Logan Man — Let us show you how easy and how profitable it is to install Logan Ring Gears.

Kauffman Metal Products Co.
Bellefontaine, Ohio

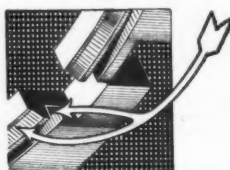
LOGAN FLY WHEEL RING GEARS



Should Be On Every Car You Sell

The Spencer Lock Tilting Steering Wheel first adds comfort in the driver's seat—then protects the car from theft. And the insurance it saves pays back the purchase price. Ask your jobber for details. Made for Ford, Dodge, Overland, Chevrolet 490 and Superior, Maxwell, Star and Gray Cars.

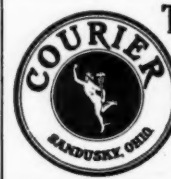
The Spencer Mfg. Co.
Spencer Ohio



See the Beveled Edge and Oil Groove of the Universal One-Piece Piston Ring

Forced Lubrication Prevents Foul Plugs. The beveled top edge and central groove keeps oil from the combustion chamber—reduces carbon. Dealers—Write for the details.

UNIVERSAL MACHINE COMPANY
Baltimore, Maryland



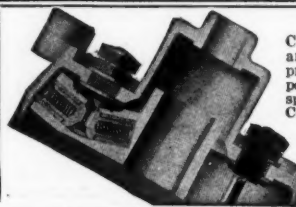
The COURIER Six

Nine body types, from \$1,295 to \$2,195

THE COURIER MOTORS COMPANY
SANDUSKY, OHIO

DREDNAUT Equalizers FOR FORDS

AUTO SPECIALTIES MFG. CO., 579 GRAVES ST., ST. JOSEPH, MICH.



THE DOUBLE CONTACT TIMER

Combines the "wipe" and unfailling. A wonderful dealer proposition. Gives full, perfect synchronization at all speeds. Contacts are positive.

E. D. Hodge Tool & Mfg. Co.
Watertown, N. Y.

Twin Timer
FOR FORD CARS TRUCKS & TRACTORS

THE CLEARING HOUSE OF THE AUTOMOTIVE INDUSTRY

FOR PARTS, ACCESSORIES, TIRES, MACHINERY REBUILDING, REPAIRING, WELDING AND USED CARS. ALSO HELP AND SITUATIONS WANTED AND MISCELLANEOUS CLASSIFIED ADVERTISING

USED AUTO PARTS

We have wrecked
over 1000 cars.
All we ask is to let
us quote you prices.

SANDERS BROS. AUTO WRECKING CO.

West Point

Iowa

WRITE US FIRST!

Save Time and Money

We carry a complete line of Automobile Parts

Transmissions (all kinds)
Cylinder Blocks Magnetos (all kinds)
Drift Shafts Carburetors
New Gears (all kinds) Starters
Used Gears (all kinds) Rear Ends

400 Motors of all kinds in stock at all times

WRITE

BENNETT BROS.

Largest Auto Wreckers in the Country
Grant and Water Sts. Pittsburgh, Pa.
Mail Orders Given Prompt Attention

We've Got Everything

In New and Used Auto Parts, Accessories and Supplies, for all makes and models of cars.

Engines; Transmissions; Clutches; Axles;
Wheels; Rims; Tires; Radiators; Gears; Axle
Shafts; Bearings; Magnetos; Starters; Gen-
erators; Coils; Batteries; etc., etc.

Ours is the largest stock of its kind in the world.

Warshawsky & Co.

World's Largest Replacement Parts House
1914 So. State St., Chicago, Ill.
No Branches Ph. Calumet 7315 No Branches

BOSCH MAGNETOS

GENUINE GERMAN BOSCH MAGNETOS, enclosed type, with platinum points, at a sacrifice. At the rate these magnetos are selling, we expect to be sold out within 30 days.

OUR PRICE	LIST PRICE
ZH6 \$18.00	\$ 60.00
ZH6 15.00 (M14)	60.00
ZR4 (2 spark) single	100.00
ZU4 (2 spark) dual	100.00

These are brand new and packed in the original cases.

Order at once as they are going fast.

WRITE—WIRE—or PHONE No. 3-5972
Special price if bought in quantity. How many can you use?

CONN. AUTO PARTS CO.
36 Morgan Street, Hartford, Conn.

ANY PART for ANY CAR NEW or USED Send for Catalogue Cincinnati Auto Parts & Wrecking Co. 712-714 Walnut St. CINCINNATI, OHIO Parts our middle name

"No Leak O" Piston Rings, nearly all sizes, packed twelve in a box, any quantity at 50% off list, terms cash. Leather Fan Belts for Fords, \$12.00 per hundred.

E. A. BOWMAN, INC.

41 Harper Ave. Detroit, Mich.

AUTO PARTS

Nearly 3,000,000 Auto Parts.
Why buy new parts, when we can SAVE YOU 50% to 75% off list?
Parts for all models, Maxwell, Overland, Studebaker, from 1910 to 1920, and others.
EUREKA AUTO PARTS & TIRE COMPANY
334 N. Capitol Ave. and 503 N. Illinois St.
Indianapolis Indiana

WICHITA AUTO WRECKING CO.

"The Old Reliable"

Offers you quick service, quality parts and absolute satisfaction,—and our prices are a little lower. We are an old reliable house and all that implies. Our stock of parts is one of the largest in the country—from a 1907 one cyl. Reo to a 1921 Overland Four.

Wichita GIVE US YOUR NEXT ORDER Kansas

JOBBER, DEALERS

Are you in the market for live wire Salesmen? Live wire salesmen are in daily touch with Motor Age because it is the most powerful merchandising paper in the field.

Attorney-at-Law and Solicitor of Patents

C. L. PARKER

Formerly Member Examining Corps., United States Patent Office

American and foreign Patents secured. Searches made to determine patentability and validity. Patent suits conducted. Pamphlet of instruction sent upon request. McGill Building, WASHINGTON, D. C.

PATENTS

BOOKLET FREE HIGHEST REFERENCES PROMPTNESS ASSURED BEST RESULTS

Send drawing or model for examination

and report as to patentability

WATSON E. COLEMAN, Patent Lawyer

624 F Street N. W., Washington, D. C.

AN UNUSUAL OPPORTUNITY is offered to purchase a series of one story buildings with tools and machinery and full line of auto material and parts, including wheels, springs, axles, carburetors, motors, etc. Buildings appraised at \$57,000; machinery and tools \$32,000; material \$201,000. Can be bought at great bargain. Fine opportunity for experienced manufacturer to establish auto plant or plant for manufacturing bodies. Situated in middle Atlantic States. Fine distributing point on three trunk line railways and plant immediately on main line with spur track. Your inquiry and investigation invited.

Address Box E-6082, care Motor Age
5 So. Wabash Ave. Chicago, Ill.

Ford Truck Converter—\$100

Redden Truck Maker (consisting of frame and whole new rear) including wheels, tires and bearings, converts any Ford Car into a two-ton truck. A limited number at special bargain. Price \$100 each. Write or wire!

LEVENE MOTOR CO.

2202 Diamond St., Philadelphia, Pa.

Wanted: Garage equipment salesmen to sell nationally advertised article part or full time. Earnings average \$6 to \$30 daily.

Address Box E-6075, care Motor Age
5 So. Wabash Ave., Chicago, Ill.

Situation Wanted Rates, 40c Per Line—Minimum Price, \$1.80
Payment in advance required.
Compute six words to line.
Forms close Thursday noon each week.

SITUATION WANTED

Situation Wanted—By Automotive Engineer. Twenty years factory and Garage experience. Used to handling men and sales. Age 40. Available in October. What have you to offer?
CARTER, Newdegate Square, Nuneaton, England

All Phones:
West 4918

LAMMERT & MANN CO.

ESTABLISHED 1894

215-21 N. Wood St.
CHICAGO

EXPERT CYLINDER AND CRANKSHAFT RE-GRINDING

SPECIAL LIGHT WEIGHT
CAST IRON PISTONS

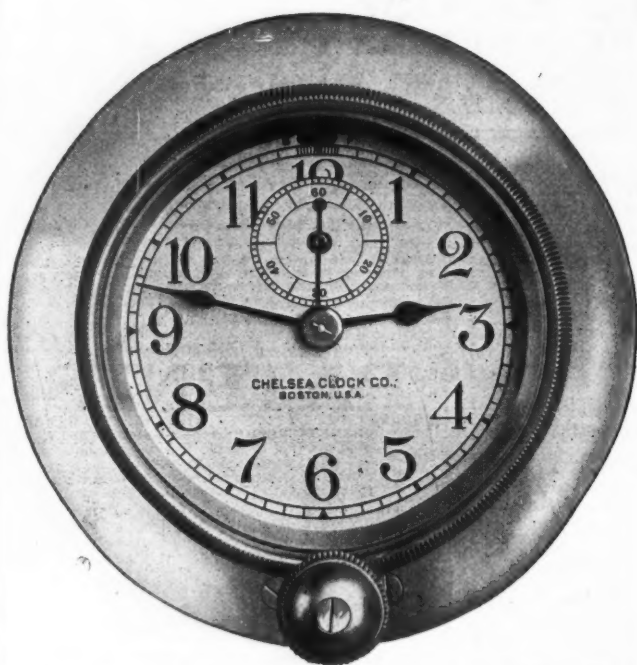
PISTONS—RINGS—WRIST PINS
SCORED CYLINDERS REPAIRED

If you have stocks of parts, accessories, or supplies for immediate disposal, the logical place to get in touch with buyers is the Classified Advertising Department of Motor Age. Here you can establish direct contact with a large group of prospective buyers, each one interested in what you have to offer. We shall be glad to go into the matter in detail with you and prepare your copy if you wish.

Classified Advertising Department
Mallers Building

MOTOR AGE

CHICAGO



The 8 Day—High Grade, Flush Inset Model J, with outside winding and setting device. (Also other models and finishes).

CHELSEA AUTO CLOCK

Over 150,000 in use by satisfied owners
ALL OTHERS are COMPARATIVE

Scientifically Built to
WITHSTAND the JOLTS and JARS
of Automobiles, Trucks, Motor Boats, etc.

— AND —
KEEP EXCELLENT TIME
— AND —

Last Practically Indefinitely
Cost More Than Others

—BUT—
THE VALUE IS THERE
ASK any USER

TO DEALERS We give you a liberal discount insuring good profit on each sale. You can confidently recommend the World Renowned CHELSEA Clocks to the most exacting customer—Many clocks wanted for replacement and equipment.

CATALOG on Request

CHELSEA CLOCK CO. Established 1897
10 State St., Boston, Mass.

Index to the

The Advertisers' Index is published as a convenience and not as a part of the advertising contract. Every care will be taken to index correctly. No allowance will be made for errors or failure to insert.

A. C. Spark Plug Co. 60 & 61, 63	Courier Motors Co. 138
A. R. G. Auxiliary Spring Co. 130	Crane Puller Co. 128
Adjustable Bearing Co. 137	Crescent Tool Co. 129
Advance Packing & Supply Co. 129	Cronk, E. D. & A. F., Inc. 132
Ahlberg Bearing Co. 142	Curtis Pneumatic Mach. Co. 57
Albertson & Co. 78	
Allen-Bradley Co. 116	
Allen Mfg. Co., The. 123	
Alvord Reamer & Tool Co. 136	
American Asbestos Co. 101	
American Automatic Devices Co. 127	
American Autoparts Co. 75	
American Hammered Piston Ring Co. 65-68	
Ames, B. C., Co. 134	
Anchor Electric Co. 132	
Anderson Motor Co. 55	
Armature Rewinding Co., Inc. 131	
Atlas Ball Co. 92	
Atwater-Kent Mfg. Co. 135	
Auburn Automobile Co. 93	
Auto Specialties Co. 130	
Auto Spring Control Co. 135	
Automatic Elec. Devices Co. 137	
Automotive Signal Mfg. Corp. 137	
Bassick Mfg. Co. 85-88	
Bearings Co. of America. 130	
Bennett Injector Co. 124	
Benzer Corp. 126	
Bethlehem Spark Plug Co. 134	
Black & Decker Mfg. Co. 3rd Cov.	
Bosch Magneto Corp., Amer. 71	
Bosch, Robert, Magneto Co. 134	
Bowser, S. F., & Co. 134	
Brunner Mfg. Co. 96	
Buick Motor Co. 115	
Bunting Brass & Bronze Co. 100	
Burton-Rogers Co. 137	
Butler Automotive Steel Co. 135	
Byrne, Kingston & Co. 77	
Canedy-Otto Mfg. Co. 137	
Carroll-Jamieson Mach. Tool Co. 127	
Chandler Motor Car Co. Bk. Cov.	
Channon-Hughson Co. 138	
Chassis Brace Co., Inc. 132	
Chelsea Clock Co. 140	
Chevrolet Bros. Mfg. Co. 132	
Chicago Solder Co. 114	
Cincinnati-Victor Co., The. 124	
Clearing House. 139	
Cleveland Auto Co. 72 & 73	
Cleveland Twist Drill. 119	
Cloyes Gear Works. 134	
Colonial Gear & Mfg. Co. 135	
Connaut Packing Co., The. 132	
Continental Motors Corp. 2nd Cov.	
Cooper Mfg. Co. 137	
Daley, I. H., & Co. 127	
Dall Motor Parts Co. 131	
Davis Palmer Co. 118	
Detroit Steel Prod. Co. 105 & 106	
Detroit Sales Service Co. 138	
Dickerson, C. A. Compressor Corp. 129	
Dill Mfg. Co. 102	
Donnelley, Reuben H., Corp. 133	
Ducenberg Auto & Motors Co. 135	
Durant Motors, Inc. 134	
Durkee-Atwood Co. 126	
Eastern Mach. Screw Corp. 135	
Elite Mfg. Co. 116	
Elk Machine Tool Corp. 59	
Empire Tire & Rubber Co. 108	
Englert Mfg. Co. 132	
Fargo Co., Inc., The. 137	
Fedders Mfg. Co. 136	
Fisk Tire Co., Inc., The. 135	
Foster-Johnson Reamer Co. 127	
Francisco Auto Heater Co. 137	
Fredericks, H. M., Co. 137	
Fremont Foundry & Bearings Works. 133	
Frenchtown Porcelain Co. 131	
Gabriel Mfg. Co., The. 98	
Gammans-Holman Co., The. 133	
Gates Rubber Co. 107	
Gemco Mfg. Co. 135	
General Automotive Corp. 83	
General Storage Battery Co. 133	
Gill Mfg. Co. 91	
Goodrich, B. F., Rubber Co. 3	
Graton & Knight Mfg. Co. 130	
Gray Motor Corp. 134	
Green Engineering Co. 138	
Harvey Rim & Wheel Co. 138	
Haynes Automobile Co., The. Ft. Cov.	
Heald Machine Co. 134	
Hobart Bros. Co. 136	
Hodge, E. D., Tool & Mfg. Co. 138	
Hoof, John C., & Co. 132	
Hoover Steel Ball Co. 125	
Huetter Mach. & Tool Co. 125	
Hyatt Roller Bearing Co. 84	

Advertisements

Indiana Rubber & Insulated Wire Co. 130
 Indianapolis Pump & Tube Co. 74, 130
 International Harvester Co. 134

Jacobs Mfg. Co. 90
 Jarvis, W. B., Co. 134
 Jenkins Vulcan Spring Co. 134
 Johnson Gas Appliance Co. 130
 Jones, Mark W. 137
 Jorgensen Specialty Co. 134

Kauffman Metal Prod. Co. 138
 Kawneer Co., The. 110
 Kelso Mfg. Co. 135
 King Sewing Machine Co. 134
 Kissel Motor Car Co. 136
 Kokomo Electric Co. 79
 Kokomo Rubber Co. 136

Laminated Shim Co. 4
 Landis Tool Co. 135
 Lomar Mfg. Co. 129

Manley Mfg. Co. 94
 Meachem Gear Corp. 128
 Mellicke Calculator Co. 125
 Melton Fender Brace Co. 128
 Mid-West Mfg. Co. 138
 Milwaukee Die Casting Co. 95
 Miniature Incandescent Lamp Co. 70
 Mohawk Corp., The. 131
 Monogram Lens Corp. 138
 Mosler Metal Prod. Corp., The. 136
 Motor Wheel Corp. 134

National Carbon Co., Inc. 121
 New Departure Mfg. Co. 109
 No-Leak-O Piston Ring Co. 132
 Nordyke & Marmon Co. 7
 Norma Co. of America. 141
 Norwalk Auto Parts Co., The. 137

Oakes Co., The. 64
 O'Brien, Clarence 134
 Otis-Flagg Corp. 135

Packard Electric Co., The. 117
 Perfection Gear Co. 137
 Phillips, F. C. 112
 Pierce-Arrow Motor Car Co., The. 137
 Pioneer Armature Co., Inc. 133
 Piston Ring Co., The. 1
 Prest-O-Lite Co., Inc. 113
 Producers Outlet Corp. 103

R. & V. Motor Co. 137
 Radiator Eng. Co. 133
 Red Giant Tool Corp. 138
 Reid Air Spring Co., The. 138
 Republic Motor Truck Co. 80 & 81
 Roland & Koch. 136

Rolls-Royce of Amer., Inc. 99
 Rose, Frank, Mfg. Co. 89
 Roth, G. A., Mfg. Co. 119
 Ruby Chemical Co., The. 130

St. Paul Welding & Mfg. Co. 121
 Sav-Oil Ring Mfg. Co. 135
 Service Equipment Associates. 135
 Snap-On Wrench Co. 141
 Spencer Mfg. Co. 138
 Springfield Mfg. Co., The. 136
 Stafford, S. S., Inc. 126
 Starrett, L. S., Co., The. 111
 Steidle Mfg. Co. 124
 Stephens Motor Car Co. 132
 Stevens & Co. 136
 Storm Mfg. Co. 133
 Studebaker Corp., The. 5
 Stutz Motor Car Co. 136

Thal & Bitter Machine Co., The. 69
 Thomas, C. T. 132
 Toledo Steel Prod. Co. 104
 Trainor National Spring Co. 2
 Trindl Co. 135
 Trusko, Inc. 122
 Tungsten Spark Plug Co. 136

Union Equipment Co. 136
 United Motors Service Co. 58
 United States Air Compressor Co. 123
 U. S. Auto Supply Co. 97
 U. S. Axle Co. 82
 U. S. Ball Bearing Mfg. Co. 76
 Universal Industrial Corp. 138
 Universal Machine Co. 138

Van Norman Mach. Tool Co. 136
 Victor-Peninsular Co. 112
 Vitek Mfg. Co. 126

Walden-Worcester, Inc. 114
 Wall Pump & Compressor Co. 135
 Warford Corporation 6
 Warner Gear Co. 136
 Watkins Mfg. Co. 137
 Waukesha Motor Co. 133
 Wayne Tank & Pump Co. 134
 Wayne Tool Mfg. Co. 136
 Weaver Mfg. Co. 135
 Wedge-Rite 138
 Weidenhoff, Joseph 130
 Welever Piston Ring Co. 132
 Welker-Hoops Mfg. Co. 136
 Westinghouse Electric & Mfg. Co. 62
 Wicaco Screw Mach. Works. 137
 Wolverine Specialty Co., Inc. 122
 Wright Mfg. Co. 120

X Laboratories 8

Zip Mfg. Co., The. 132

Snap-on

INTERCHANGEABLE
Socket Wrenches

The biggest selling auto tool today. Hundreds of dealers are making big profits selling Snap-ons because they sell in assortments as easily as ordinary socket wrenches sell singly. Sell themselves, and one sale brings in another. Write for details of our Special No. 750 Snap-on Stock and Display Board Set.

MOTOR TOOL SPECIALTY CO., DISTRIBUTORS,
14 E. Jackson Blvd., Chicago

SNAP-ON WRENCH CO., MANUFACTURERS,
Milwaukee, Wisconsin

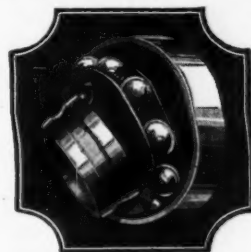
EASY TO SELL
In Mechanics' and
Owners' Complete Sets



Snap-on means many sockets and few handles. Get into hard places easy and stand any strain. Try them on your own car.

"NORMA"

PRECISION BALL BEARINGS



Internationally recognized as the standard bearings for ignition apparatus and lighting generators

THE NORMA COMPANY
OF AMERICA

Anable Avenue
Long Island City New York
BALL, ROLLER AND THRUST BEARINGS



BEARINGS

for every application



For fifteen years we have been compiling records covering sizes & types of bearings used in all forms of automotive equipment

This information in the possession of each of our 37 Branches renders them especially fit to help you get the correct bearing for any application. When you want bearing information call our nearest branch

BRANCHES

In thirty-seven cities!

AHLBERG BEARING COMPANY

321 East 29th St. Chicago

GENUINE BLACK & DECKER PORTABLE ELECTRIC DRILLS

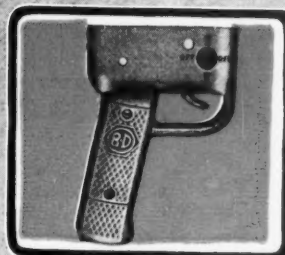
can be easily distinguished in three ways

1. The well known Black & Decker hexagonal trade-mark on the nameplate. This trademark is registered in practically every civilized country in the world.

2. The motor case is also hexagonal in shape corresponding with the trade-mark. This makes an exceptionally rigid case and the corners leave open spaces around the motor field making it possible to ventilate and cool the outside of the motor field as well as the inner circumference.



3. "The Pistol Grip and Trigger Switch" is thoroughly covered by mechanical patents preventing its duplication by others, although others have designed portable electric drills which have a handle and switch somewhat similar in appearance. The genuine "Pistol Grip and Trigger Switch" is used by us only, and in two styles as illustrated. The final test of genuineness is to operate the switch. The genuine Black & Decker "Pistol Grip and Trigger Switch" stays "on" or "off." It need not be held in either position. One pull of the trigger switches the current on, and it stays on until the trigger is pulled again, after which it stays off until again pulled. It is this feature which has made it so popular.



For your own protection we urge that you apply these three tests and satisfy yourself that you are getting the genuine article.

THE BLACK & DECKER MFG. CO.

Towson Heights, :: Baltimore, Md., U. S. A.

Branch offices and service stations carrying complete stocks of parts and operated by factory trained men located in

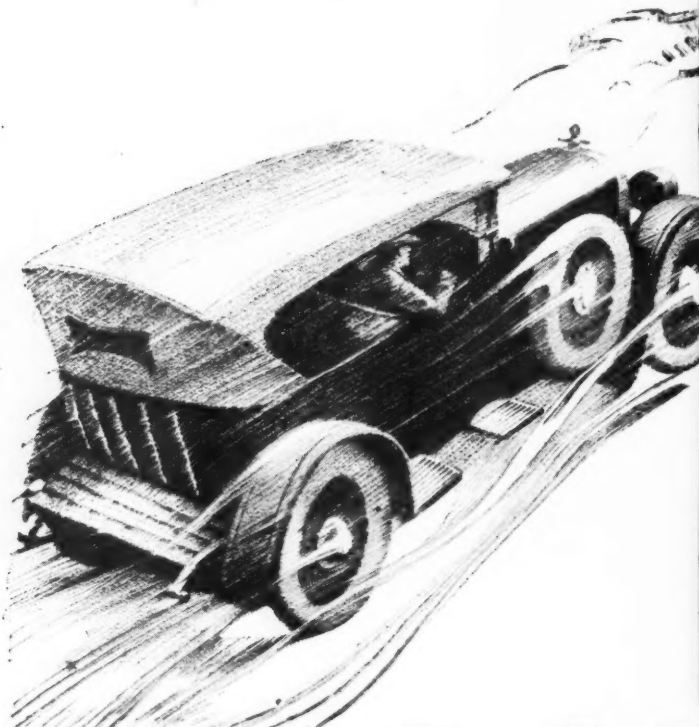
Boston
New York
Atlanta

San Francisco
Philadelphia
Kansas City

Detroit
Chicago
Cleveland

Canadian Factory, Lyman Tube Bldg., Montreal, P. Q.

BIGGER SALES *Produced by* MASTER PERFORMANCE



THE REMARKABLE way the Chandler continues to outsell other cars of its class, still serves as a topic of talk throughout the industry.

Chandler dealers are enjoying big sales — and correspondingly big profits — simply because the phenomenal capacity of the

Pikes Peak Motor

enables them to out-perform and out-demonstrate *anywhere*, under any conditions cars costing up to \$3000.

Add to this master performance these other important sales factors: low prices, striking new bodies in a wide variety of colors, and a rugged, long lived, easy riding chassis. Then you will understand what is making 1923 a wonderfully successful year for Chandler dealers and opening up even bigger prospects for 1924.

To desirable dealers in open territory we are ready to assign the Chandler franchise under a liberal contract which is written without a termination date. This is an exceptional opportunity. One worth inquiring about immediately — *today!*

THE CHANDLER MOTOR CAR CO.
CLEVELAND

Export Dept. 1819 Broadway, N.Y. C., Cable Address "Chanmotor"

CHANDLER